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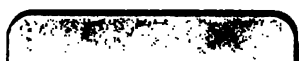
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EIGHTH ANNUAL REPORT

OF THE

STATE MINE INSPECTORS

OF THE

STATE OF MISSOURI.

FOR THE

YEAR ENDING JUNE 30, 1894.



JEFFERSON CITY, MO.:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.

1894.
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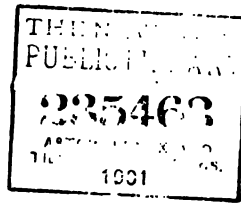


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LETTER OF TRANSMITTAL.

STATE OF MISSOURI, }
OFFICE OF STATE MINE INSPECTOR. }

To the Hon. HENRY BLACKMORE, Labor Commissioner, Jefferson City, Mo.:

SIR—I have the honor to submit this the eighth annual report on the coal mines of Missouri, for the year ending June 30, 1894.

The past year has been the most disastrous to the business and to the miner ever experienced by the coal industry in this State. The alarming and serious conditions growing out of the business stagnation, and the prolonged, universal and unprecedented strike, are too well known to you to justify me in further mention of them. I desire, however, to thank you for the timely and lively interest displayed and exercised by you during the season of unrest, uncertainty and alarm, and for the personal aid and assistance rendered me in many of the trying and perplexing situations which we passed through. I am, above all things, truly thankful that the troublous times passed with so little of violence, and that the miners of the State have acted so wisely and prudently. Mr. J. W. Marsteller deserves special mention in connection with this report. He has at all times shown a deep interest in everything pertaining to the mining industry. He is accurate in calculations and adept as a draughtsman, and to his fidelity and capability much credit is due for the statistical presentation, and his suggestions have been valuable in other directions; all of which I take pleasure in acknowledging. I thank you, and through you your office assistants, for very many favors shown me.

Respectfully,

CHARLES EVANS,
State Mine Inspector.

INTRODUCTION.

During the fiscal year ending June 30, 1894, I have made over 300 inspections, with reference to the safety, sanitary condition and ventilation of mines, and to secure an escapement for the miners in case of danger.

The mines have been visited as often as the condition seemed to require. Where a deficiency in the ventilation was found, or the safety of the miner neglected, instructions were given to have the evils remedied at once; and with very few exceptions, where orders have been given, they have been complied with in a reasonable time, although some of the mines had to be visited the fourth time to enforce a compliance. The hardest and most difficult task I had to contend with during the past year was to secure an avenue of escape for the miners in case of accident, and was compelled to close down several mines for non-compliance with the law.

My experience with quite a number of the coal companies of the State, within the last year, in the matter of escapement shafts, has been a very trying and annoying one.

The beginning of the fiscal year found many coal companies in the position of having already, and for too long a period, violated the law with reference to the time when escapement shafts should be sunk.

Feeling that I had no discretion in the matter, but must obey the law, I determined that all coal mines requiring escape-shafts, in accordance with law, must either be supplied with such escape or be closed. With this in view, every effort has been made to have an escape-shaft sunk where required.

A glance at the table on improvements in this report will show more escapement shafts sunk during the past year than the record of any two previous years. Out of 365 mines operated last year, there is but one mine which has neglected to comply with the demand made for an escape-shaft, and in this case suit has been ordered against the operator. Among the many shafts ordered sunk, there were a number that had to be sunk from two hundred to nearly five hundred feet deep.

With those familiar with this kind of undertaking, the importance of such work is easily understood, as it contemplates the employment of more men, more power and machinery, and the expenditure of thousands of dollars. For any company such requirements may well be considered a serious matter; and, unfortunately, in the prosecution of this work, parties were required to sink such shaft, whose financial abilities were not equal to such undertaking. I call to mind instances where the coal companies were laboring under the disadvantages of deep shafts, faulty and uncertain coal, the price of mining in excess of competitors; the hard times of the past year resulting from a stringency in money matters; strikes, with the attending expense of keeping the mine in repair; with very little business or income, and when business was offered it was met by the sharpest competition; in fact, these mines were simply paying labor and operating expenses. The men interested in these mines had their little all of hard-earned savings tied up in a business producing no revenue, and with small prospect of ever receiving any; yet, from a hope inborn in man, they were anxious to proceed, trusting to some chance or change by which the situation might be improved. Then, to be faced with the threat that the shaft, which they have no ready means to sink, must be sunk or the mine closed, is indeed a serious matter—knowing as they did that to close the mine was ruin, and to sink the shaft was to borrow or go down in their pockets and throw more good money after bad.

The appeals from these men for more time (with a full knowledge of the situation), to me were most reasonable; and had the enforcement of the law been left to my discretion and judgment, I would have been only too glad to say to them, "Go ahead, do the best you can, and sink the shaft when times are better." This feeling was fortified by appeals made by the miners for whose especial benefit the law was enacted; they would come to me and insist on not shutting down the mine; times with them had been extremely hard, work was slack everywhere, they knew not where to go if work was shut off, nor did they have the means to take them with their families to other points. This placed me between two fires, but I am consoled in the reflection that the law is a good one and should stand, and that while its provisions may work a hardship on a few isolated cases, yet the great body of miners throughout the State are made safer and healthier, and it is better that a few members should suffer, rather than the entire body.

The sanitary conditions of the mines have been greatly improved during the past year, as will be seen by reference to the table of improvements in this respect. Twenty-four escapement-shafts and 15 second air-shafts have been sunk, 6 fans have been erected and 18 fur-

naces built and 3 rebuilt and enlarged, 18 covers and 28 safety-catches were put on cages, 4 safety-gates around shaft openings were hung and 44 hoisting ropes were condemned and replaced by new ones. Escapement-shafts sunk last year are considerably larger in size than former ones, and the furnaces are also built larger, which will give a greater volume of air. Airways have been widened out and cleaned and overcasts erected, and the more practical method of splitting the ventilative current into separate divisions has been adopted at many of the new mines.

REPORT.

We regret very much to make the statement that this, the eighth report of this Department, shows a decrease in the amount of coal mined as compared with previous year's output. It is the only one in the history of the coal mining industry of the State that does so. The causes leading to this result are so potent to all intelligent and observing men, as to make any attempt to explain them unnecessary. For our fiscal year, ending June 30, 1894, the coal product of the State falls 807,120 tons short of the amount mined during the previous year. If other lines of business had suffered in like proportion, some idea of the magnitude of the aggregated loss to business could be formed. However, it is not likely (with perhaps one or two exceptions) that the loss in any one enterprise or industry has been so severe as in that of coal mining, since it had to contend, not only with a depressed business, but with the most disastrous strike heretofore experienced.

During seasons of financial trouble, we may look for timid and cautious action in all matters of business, from whatever source or direction we find moneyed interests employed. The past year has furnished a severe experience along this line, and no difference whether the cause for it has been a real or imaginary one, the result has been the same. At any rate, business has suffered from general stagnation, coal mining especially. As the machinery in all channels of trade, commerce and manufactures must be moved by the product of the mines, this condition of business has had the effect of causing all other industries to contribute a share of its hardship to the coal trade. When an industry employing nearly 9000 men experiences a falling off in its product of 25½ per cent, as the coal-mining industry of this State has during the last year, it is but natural to recognize in the situation, causes for distress to the miner and serious complications for the operator. Unfortunately for the coal operators, and the miners as well, there have been added to the discomforts arising from general stagnation in business all the evil effects of a prolonged strike, bringing about an enforced idleness to the mines, and thus entailing a loss of huge proportions; for, aside

from loss of trade, the lying idle of large mines is an expensive and serious matter. While it is true that the mine-owner may still possess his unmined coal, yet to lie idle means more than loss of income from the large capital represented in property and plant, for a still greater difficulty confronts him, and that is, that though not a pound of coal is mined, still the situation demands the employment of a force day and night to preserve the mine from decay and destruction.

It has been demonstrated time and again, that there is much less trouble experienced in keeping a mine in a safe condition while in active operation, than it is during seasons of idleness. In fact, a difference is detected during the idle hours of a night, after a busy day's work, as observation teaches that falls are much more frequent in a mine during the night, than at any other time within the twenty-four hours. For these reasons, the greatest care and attention must be given an idle mine; otherwise, an accumulation of water, gas and falls will result in its destruction, or its reclamation accomplished at immense cost.

As for the miners, there has been no experience in the mining of coal in this State that will compare with the hardships they have endured during the past year. And to their everlasting credit let it be recorded, that by reason of their noble conduct in the exercise of wisdom and prudence under most exciting and trying circumstances, they prevented the shedding of blood and the destruction of a vast amount of property.

From a careful estimate made of the loss sustained by the miners of this State during the past year, owing to lack of business and the prolonged strike, we find that a sum not less than \$580,000 will cover the loss. Further estimates in this connection reveal the following: that the men actually digging coal, and not including other help around the mines, averaged 159 days' work out of the 365, and the average earnings for the year amounted to \$287.33.

To arrive at the net earnings of the miner, we have estimated for cost of powder, oil, blacksmith and doctor, and in view of the small average number of days worked the past year, the estimate for the above has been placed at \$26.12, or about half the expense for a full year's work; the fact that powder is not used in all mines has been considered in making the estimate; to the above must be added house-rent for a year, which is not less than \$50. These two sums approximately constitute the expense deducted from the miner's pay; so that at the end of the year the miner's account would stand about as follows:

Total earnings for the year.....	\$287 33
House-rent for the year.....	\$50 00
Other expenses.....	26 12
Total expense.....	76 12
Net earnings for the year	\$211 21

or an average of \$17.60 per month, with which the average miner has fed and clothed himself and family. The following is the average result of the operations of 73 of the best mines in the State during the past year :

Out of the entire coal production, 73 mines or 20 per cent of all mines produced 80 per cent. The average number of miners employed was 4839. The average number of days worked was 159. The total number of days worked was 772,506. The total number of tons of coal mined was 1,924,769. The average price per ton received for mining was 72 cents. The average daily earnings amounted to \$1.80. The earnings for the year amounted to \$287.33.

Still another feature worthy of attention, is the fact that in this State there are 5 companies, representing but $1\frac{1}{2}$ per cent of all operators, mining 57 per cent of all the coal produced in the State. These facts, together with the general tendency in all branches of business to consolidations, lead us to the belief, with nothing personal intended to either of the large corporations of this State, as we feel that in their treatment of employes and their faithful observance of the mining laws, that they are much above the average, compared with other sections of the country: neither do we fail to recognize as a fact, and perhaps a necessary evil, that while consolidated coal companies, monopolies, or by what other name they may be designated, are permitted to exist and operate in other states, it would prove an injustice and work a hardship to the general business and coal interests of this State, in the competition for business, to prevent like organizations to exist here.

This being so does not, however, detract from the fact that largely the troubles in the matter of reduced prices may be traced directly or indirectly to the existence of large corporations and consolidations. The opportunity and very decided advantages of organized effort, backed by big money, to thwart the aim and purpose of the individual or small concern in a business way, is too plain to admit of argument—especially so when as a rule the large corporation possesses the best coal property, and the most expeditious and economical machinery for handling the product, together with the best facilities for shipping it. The ability to do a large business enables them to secure contracts in

preference to the individual or small concern, even though the terms are equal; for it does appear that the extra ability to perform a contract acts as a deciding reason why the large concern should have it. The opportunity to control labor and prices is greatly increased when a few large concerns do the greatest volume of business. If, instead of five companies doing fifty-seven per cent of the entire coal mining of the State, the same proportion was divided up into fifty different companies, the many conflicting interests would prevent concentrated effort in any given direction, and the opportunity to reduce prices would be greatly lessened.

For the purpose of showing prices received for coal, the table below will indicate the average prices for which coal was sold at the mines during the past six years :

For 1889, year ending on 30th day of June.....	\$1.31+
1890, " " "	1.32+
1891, " " "	1.01+
1892, " " "	1.26+
1893, " " "	1.25+
1894, " " "	1.26+

From the above it will be seen that the decrease in price of coal in the past six years, has been but 5.6 cents per ton, while the price paid for mining has decreased five times as much in the same length of time. The individual consumer of coal pays about the same price that he paid six years ago. But the railroads and large corporations manage to secure their supply of coal at figures much less than they did some years past, and there are reasons that can be found why this is so. We are disposed, at times, to lay the blame for decreased prices directly to these corporations; but back of them we may look for the cause.

The railroads, corporations, manufactories and other large enterprises, it must be remembered, are very generally managed by men who are not stockholders in the respective enterprises, but men pre-eminently qualified by experience to transact the respective lines of business upon strictly business principles. They are expected to secure the largest possible results at the least possible expense, and particularly to arrive at results as cheaply as competitors in the same line of business. This is what they are paid for, and their reputation and the permanency of position are dependent upon their business-like and economical administration of their trusts. In these days of small margins and sharp competition, in order to keep operating expenses down to a par with a competitor more fortunately located with reference to cheap fuel, demands are often made (to our certain knowledge) upon coal companies for a reduction in the price of coal that often prove a

hardship, because less able to furnish coal cheaper than the competitor in another coal district. The party making the demand for a cheaper price feels himself at a disadvantage so long as his competitor secures his fuel cheaper. It is business with him, pure and simple, and his ultimatum comes, "I must have my coal this year at such price, or I shall make my contract elsewhere." The operator who has been furnishing his coal as cheaply as he can afford, has but two things left him: he must either reduce the price paid for mining or close his mine.

The real cause of the trouble comes in just here—it is this: that in the distribution of the minerals of this world they have not been deposited in equal quantity, quality, depth, or under equally favorable conditions for their extraction at all points where found. There are districts where the coal is easily reached, abounding in large areas of great thick seams, which give to them not only the very decided advantage of producing a much larger yield per acre than other districts, but with the additional advantage of having it mined very much cheaper as well as handled cheaper than can possibly be accomplished in other districts less favored, and that such districts can and do undersell the others goes without saying. While the remedy for securing just and equitable remuneration to the operator for his product, and to the miner for his labor, must remain a most unfortunate and perplexing problem, yet we have but to look calmly and soberly at the situation to discover the stubborn fact that all through it is business; that individuals, railroads, manufacturers and all kinds of business enterprises, in the effort to secure fuel at the cheapest rate, are but exercising the right and privilege so highly prized by each and all of us, and so generally made use of when the opportunities present themselves.

TABLE I.

*Recapitulation of coal mining operations in Missouri for the year ending June 30th, 1894,
compared with the year ending June 30, 1893.*

	1893.	1894.	Increase and decrease, compared with '92.	
			Inc.	Dec.
No. counties in the State reporting on coal produced.....	34	34	.....
No. mines in the State, including strip-pits	403	365	.....	38
No. mines employing 10 or more men.....	135	136	1	
No. fans in use	54	56	2	
No. tons produced	3,150,442	2,383,322	.....	807,120
Amount received for total output	\$3,999,681	3,013,075	.....	986,606
Average amount received per ton at mines	1.253	1.264	1.1c	
Total number men employed in winter....	9,232	8,864	.....	368
Total number men employed in summer...	6,301	6,424	123	
Total number miners employed in winter..	7,285	7,168	.....	117
Total number miners employed in summer	4,859	5,083	224	
Total number other employes in winter....	1,947	1,696	.....	251
Total number other employes in summer..	1,442	1,341	.....	101
Total number kegs powder used	64,553	52,728	.....	11,825
Total cost of powder.....	\$131,131	103,885	.....	27,246
Total number men killed in mines.....	21	19	.....	2
Total number of wives made widows	13	13	.....
Total number of children made fatherless.	43	24	.....	19
Total number of non-fatal accidents	26	27	1	
No. tons mined for each life lost.....	151,926	125,438	.....	26,488
No. tons mined for each non-fatal accident	122,709	82,271	.....	40,438
No. of new mines opened.....	17	16	.....	1
No. of mines worked out or abandoned...	7	11	4	

TABLES II, III AND IV.

TABLE II.

This table is a record of new mines opened and old mines abandoned during the past year, with the name of company or operator opening a new mine or abandoning an old one.

TABLE III.

This table is a recapitulation of all the improvements at all mines, grouped in totals under the respective kinds of improvements.

TABLE IV.

Table VI furnishes in detail the improvements made at each mine in the State; gives the name of mine or operator of mine making the improvement, etc. From these tables it may be observed that many valuable improvements have been made during the past year, in face of the hard times and uncertainties. A very creditable number of mines have been opened, and in the matter of air and escapement-shafts, a much larger number have been sunk than in any other year; and it may be said with reference to new cages, hoisting-ropes, safety-catches and cage-coverings, that more of each have been put in place than heretofore, while the other improvements in the aggregate, compare favorably with other years. Special effort has been made persistently, to secure air and escapement-shafts where required, and in replacing all safety appliances where the old ones are in the least doubtful.

TABLE II.

New Mines opened and Old Mines abandoned.

New mines.			Mines abandoned.	
Name of operator.	County.	No. of new mines....	Name of operator.	No. mines abandoned.
Pennsylvania Coal Co...	Adair	1	Pennsylvania Coal Co	1
Davis, C. C.....	Audrain.....	1	.....	.....
Wear Coal Co.....	Barton	1	.....	.....
Harley & Hensley.....	Bates	1	Rich Hill Coal & Mining Co.....	1
Blackfoot Coal Co.....	Boone.....	1	.....	.....
	Caldwell .....	.....	Cowgill Mining Co.....	1
Colorado Mine.....	Henry.....	1	Blair Black Diamond.....	1
Michaels & Sheridan....	"	1	.....	.....
Thompson Bros.....	"	1	.....	.....
Riley & Keist Coal Co..	Lafayette	1	Lexington Coal Co Hacket Mine.	1
Salt Fork Coal Co.....	"	1	Napoleon Coal Co.....	1
Southwestern Coal Co..	"	1	.....	.....
Brookfield Coal Co.....	Linn	1	.....	.....
Loomis Coal Co.....	Macon	1	Kansas & Texas Coal Co.....	5
Watson Coal Co.....	"	1	.....	.....
Caffery-Baker Coal Co..	Randolph.	2	.....	.....
Eagle Coal Co.....	"	1	.....	.....
Richmond Coal Co.....	Ray.....	1	.....	.....
Douglas & Hastings.....	"	1	.....	.....
Totals.....	.....	19	.....	11

TABLE III.

Recapitulation of Improvements Made at Mines for Year Ending June 30, 1894.

New mines opened, shafts.....	15
New mines opened, slopes	1
New mines opened, drifts	3
Shafts retimbered.	6
Air-shafts or second opening sunk	15
Escapement-shafts sunk	24
Escapement-shafts stairways	6
Furnaces built.....	18
Furnaces repaired	3
New fans erected	6
Fans removed to new mines.....	1
Engines, new	15
Engines repaired.....	1
Boilers, new	2
Horse-powers, new	2
Shaking screens, new	1
Self dumping cages, new	4
Cages, new	32
Cages repaired.....	6
Holisting ropes, new	44
Catches (safety), new	28
Guides for cage, new	4
Covering for cages, new	18
Gates around shaft, new.....	4
Pulleys, new	2
Drums, new	1
Hoppers, new.....	4
Pumps, new	3
Scales, new	4
Overcasts, new	4
Engine-houses, new	11
Boiler-houses, new.....	1
Miners' houses, new	51
Tip-houses, new	6
Tip-houses repaired.....	1
Pit-heads, new	17
Smoke-stacks, new	1
Trestles, new	2
Hoisting apparatus, new.....	11
Mine cars, new	510
Cables for underground work, feet	8000
Landing platforms, new	2
Side-tracks and switches, miles.....	3½

TABLE IV.

Showing by counties the principal improvements made in and about Coal Mines during the year ending June 30, 1894.

Name of company.	County.	Improvements.
Pennsylvania Coal Co.....	Adair.....	New drift mine opened; air-shaft sunk and erected at same. At the old mine an air-shaft has been sunk and furnace removed and enlarged. Ten new houses erected for the accommodation of miners.
D. C. Scott.....	Adair.....	New shaft sunk, and equipped with new ropes and cages. Two new scales put in.
Martinsburg Coal Co.....	Audrain.....	Escapement shaft completed, covers and safety-catches put on cages, and furnace built.
Farber Coal Co.....	Audrain.....	New furnace built.
C. Turpin.....	Audrain.....	An escapement shaft completed.
Vandaha Manufacturing and Mining Co.	Audrain.....	A larger engine substituted for old one, new engine-house, pit-top and platform constructed, two new cages and ten pit-cars built.
Minerd Bros.....	Barton	Air-shaft sunk and furnace built.
Wear Coal Co.....	Barton	Escapement shaft sunk, fan erected, stairway put in and new houses for miners erected.
Field, C. W.....	Bates	Air-shaft completed.
Harley & Hensley	Bates	New slope mine opened, air-shaft sunk, trestle and tippie built.
Hudson & Co.....	Bates	Drift mine opened and air-shaft sunk.
Martin & Gee Coal Co.....	Bates	New pump placed in mine.
Rich Hill Coal Co.....	Bates	Overcast at mine No. 15 constructed, entries timbered, 75 pit-cars added and many old cars removed.
Manchester, Thos. & Son.....	Bates	New pit-head and hoisting apparatus erected, five new cars added and switch track graded.
Sullivan, Wm.....	Bates	Furnace repaired, main entry and air-shaft retimbered.
Carter & Smith.....	Boone	New shaft sunk and hoisting equipment erected.
Blackfoot Coal Co	Boone	New pit-head and hoisting apparatus erected, escapement shaft in process of construction.
Columbia Coal Co.....	Boone	Hoisting engine substituted for horse-power, new engine-house and pit-head built, and new cages, guides and ropes put in.
Johnson, J. M.....	Boone	Air-shaft sunk
Rogers, George.....	Boone	New shaft sunk and equipped.
Hamilton Coal Co	Caldwell.....	New pump placed in mine, boilers repaired, and 50 new pit-cars added.
Kingston Coal Co.....	Caldwell	Escapement-shaft in course of construction.

Henderson, J. F.....	Callaway.....	Air-ways enlarged.
Fulton Fire-Brick and Mining Co.....	Callaway.....	An extensive stone building erected and supplied with most improved machinery for the manufacture of fire-brick and other articles. New platform, trestle, and hoisting ropes added.
Grundy County Coal Co.....	Grundy.....	New foundations built, engines repaired and reset, new engine-house and pit-house built, two new cages built and two new ropes put on.
Braun, Ed. Coal Co.....	Henry.....	New pit-head erected.
Blanchard & Sons, D. C.....	Henry.....	Shaft sunk and same equipped with hoisting power and furnace built.
McBeth, R. C.....	Henry.....	Shaft sunk and equipped, new hoisting machinery, new pit-scales and ten new pit-cars added.
McFadden & Co.....	Henry.....	Iron substituted for wooden track.
McCloud, A.....	Henry.....	Air-shaft sunk.
Michael & Sheridan.....	Henry.....	New pit-head and hoisting apparatus and pumps erected, escapement shaft sunk, furnace built and half a mile of track constructed.
Thompson Bros.....	Henry.....	New pit-head built, escapement shaft sunk, furnace built and a half mile track constructed.
Braman, F. W.....	Henry.....	Safety-catches placed on cages.
Colorado Mine.....	Henry.....	Hoisting engine erected, new engine-house and pit-head built, an escapement shaft sunk and fan set, two new cages with covers and catches, and new ropes, new gates built and half a mile of track laid.
Kansas City Clay and Coal Co.....	Jackson.....	Escapement shaft sunk and two new cages built.
Boyd, Thos. & Sons.....	Johnson.....	New hoisting ropes put in.
Fitch, P. D.....	Johnson.....	Air-shaft sunk.
Carter, Andrew.....	Lafayette.....	Air-shaft sunk and furnace repaired.
Corder Coal Co.....	Lafayette.....	New stairway erected in escapement shaft.
Dorhman & Co.....	Lafayette.....	New shaft sunk and equipped with horse-power.
Bartel, Harry.....	Lafayette.....	Air-shaft completed.
Hendrick, L. P.....	Lafayette.....	Air-shaft sunk and drainage perfected.
Lexington Coal Co.....	Lafayette.....	Pit-head at Hartman mine rebuilt and made higher; shaft retimbered, airways cleaned and enlarged, old cars renewed, 150 new cars, 11 new houses for miners, and furnace built.
Rocky Branch Coal Co. (now Farmers' Consolidated Coal Co).....	Lafayette.....	Smoke-stack built.
Salt Fork.....	Lafayette.....	Hoisting machinery, new pit-head gear erected, escape shaft sunk, stairway in same, and furnace built, two new cages with ropes, guides and catches, 25 new pit-cars and new side-track.
Seawell & Co., J. M.....	Lafayette.....	Two new hoisting ropes, catches for cages and gates hung around pit-top.
Walton, Thomas.....	Lafayette.....	Seven hundred feet of rock taken down on main entries to increase height of same.
Wellington Coal Co.....	Lafayette.....	Furnace repaired and enlarged, air-shaft bottom taken up and track relaid.

TABLE IV—Continued.

Name of company.	County.	Improvements.
Y. S. A. Coal Co.	Lafayette....	Pit-head rebuilt and entries enlarged and heightened by shooting down rock; new road opened.
Bonanzo Coal Co.	Lafayette....	New pit-head gin, top-house and tippie erected.
The Southwestern Coal Co.	Lafayette....	Fair of n-w engines, new engine-house and pit-head erected, two new cages, ropes, catches, coverings and gates put in, fan erected, escape-shaft in process of construction, 40 pit cars added, $\frac{1}{4}$ mile track laid.
McGrew, J. C.	Lafayette....	Twenty new houses for miners built.
Waverly Coal Co.	Lafayette....	Escapement-shaft sunk, stairway built and furnace erected.
Matthews Coal Co.	Lafayette....	Escapement-shaft completed and furnace built.
Bottomly, J. C.	Linn.....	Top of shaft retimbered, new hoisting rope put on and catches added to cages.
Landreth & Son.	Linn.....	Escapement-shaft in process of construction.
Marceline Coal Co.	Linn.....	Pit-head remodeled and new track to land cars.
Brookfield Coal Co.	Linn.....	New engine, engine-house and pit-top erected, new cages, ropes, catches, coverings put in, escape-shaft sunk, furnace built, and 25 new cars added.
Clark Mine.	Linn.....	New cages, ropes, safety catches, covers put in.
Cox, W. A.	Livingston ..	New pulleys, drum and ropes.
Bevier Black Diamond.	Macon	Shaking screen substituted for revolving screen, with engine to work same.
Kansas & Texas Coal Co.	Macon	New and larger engine in place of old one at mine No. 43, also self dumping cages, new hoppers and new ropes. At mine No. 33, improved grip for rope haulage, self dumpers and hoppers.
Loomis Coal Co.	Macon	At mine No. 4, two cages rebuilt, new covers and catches for same, 8000 feet cable rope and new engine to work same. At No. 7, new engine-house, head-gear, new ropes, catches, cages, covers, escapement-shaft sunk, stairway in same, fan erected and 30 new pit cars.
Watson Coal Co.	Macon	New engine, engine and boiler house and new pit head built, new cages, ropes, catches covers, gates, an escape-shaft sunk, stairway built, fan erected, 30 new pit cars and one mile of track laid.
Little Pittsburg Coal Co.	Macon	Ten houses for use of miners, shaft partly retimbered, and two cages rebuilt.
Howard, J. H.	Nodaway	New scales.
Carson, A.	Pettis	Steam-power substituted for horse-power,

Mendota Coal Co	Putnam	At mine No. 4, new and larger engine and 25 feet added to landing platform.
Breckinridge Mines	Randolph	At mine No. 14, an overcast, and at No. 34, air shaft sunk and overcast built.
Caffery & Baker Coal Co.	Randolph	At mine No. 26, air-shaft sunk and furnace built. At mine No. 20, an overcast. At mine No. 30, an air-shaft sunk and furnace built.
Fleming Coal Co	Randolph	Two new hoisting ropes.
Higbee Coal Co	Randolph	Two new cages put in and shaft partly retimbered.
Eagle Coal Co	Randolph	New engine-house and pit head built, escapement-shaft sunk, furnace built, new ropes and cages and ten new pit cars added.
Morris, J. J.	Randolph	Air-shaft sunk.
Williams, J. B.	Randolph	Cages repaired and new ropes put on.
Blasell Coal Co	Ray	Escape-shaft sunk and furnace built.
Bovard & Brown Coal Co.	Ray	New engine-house, new engine and two new hoisting ropes.
Darneal Coal Co	Ray	Top building and hoisting gear, new hoisting ropes and cages.
Diamond Coal Co	Ray	Furnace built.
Leoven, Joseph	Ray	Pit-top repaired.
Walsh & Henry	Ray	Iron track laid in mine and shaft retimbered.
Williams, R. J.	Ray	Two new hoisting ropes.
Mock, F. J.	Schnuyler	Hoisting apparatus and tippie erected.
Douthat & Vannice	St. Clair	Horse-power, hoisting gear and escapement shaft sunk.
Seymour, W. A.	St. Clair	Main entries brushed and retimbered.
Walker Bros.	St. Clair	Air-shaft sunk and new scales put in.
Rich Hill Coal & Mining Co	Vernon	Escapement-shaft sunk and a 15-foot fan put in place.

COAL.

The origin of coal is no longer a debatable subject, as it is now universally held by men of science that beds of coal have been formed from the decomposition of vegetable matter—the leaves and stems of ancient plants and trees, that grew, died, decomposed and became mineralized on the spots now occupied by coal-beds; and that the associated beds of rocky strata have been formed from the sediment of the water which flowed over the carbonaceous accumulations during the subsidence of the land.

Although coal is found in several parts of the world associated with the rock of different periods, yet practically, it may be considered as existing only with those formed in the carbon period, so called on account of the occurrence of abundant coal deposits; for in no other period are the deposits of sufficient extent or of the required quality to be commercially valuable. Hence, searching for coal in any other formation is a labor holding out but faint hope of reward. The associated rocks known in connection and as the coal measures, consist of a series of beds of sandstone, shale, limestone, fire-clay, iron-stone and coal in manifold alternations. In most cases a bed of clay lies immediately beneath and a bed of shale immediately above a seam of coal; that which lies beneath is known as the under-clay or seat of the coal seam, and generally consists of a more dense and plastic clay than that which lies above the seam and forms its top or roof.

The under-clay formed the soil upon which the plants grew, and from which, ultimately, the coal was formed, and, as might reasonably be expected, contains numerous traces of the roots of such plants. It is remarkable that nothing but the roots of the plants are found in the under-clay, and traces of the same consist of dark, carbonaceous, fibrous-looking streaks traversing the mass in all directions. As the under-clay originally formed the soil upon which the coal-plant grew, we might expect it found everywhere and invariably present with the coal. As a matter of fact, this is so as a rule, but there are exceptions though of rare occurrence, where the under-clay is absent, and in such cases it may be inferred that the materials from which the coal was formed were drifted in their present location. The existence of the under-clay greatly facilitates the extraction of the coal. The slate which forms the roof is of a more indurated character than that of the bottom, its structure being that of a true shale. It is more frequently absent

than the under-clay, and its absence is detrimental to the economic and satisfactory working of the coal.

Indeed, there can be no doubt that coal seams are the remains of a former mass of luxuriant vegetation of submerged pine-forests, jungle-growth and peat mosses. Deriving its origin from such source, coal-seams must of necessity vary greatly in thickness, since the vegetation of one age or one place would differ widely, in luxuriance and length of existence, from that of another age or place. And as a matter of fact, we find coal-seams varying from one inch to forty feet and upward, in thickness.

MISSOURI.

The coal measures of Missouri cover all that portion of the State lying north of the Missouri river and embracing the following counties in the west and southwest part of the State, and south of the river: Barton, Bates, Cass, Cedar, Cooper, Dade, Henry, Jackson, Lafayette, Pettis, Saline, St. Clair and Vernon. It must be remembered, however, that the coal measures are not supposed to be entirely underlaid with coal, as sometimes even a four-foot seam of coal will suddenly dwindle down to a mere trace, and often cut away entirely. The coal measures proper are supposed to enter the State about the northwest corner of Jasper county and to pass through the State diagonally to Schuyler county. Geologists claim the coal measures of the State comprise an area of 23,000 square miles. The thickness of the upper coal measure, it is claimed, is 1317 feet, including only about four feet of coal, of which there are two seams of one foot each, the remainder being mere streaks. The middle coal measure is about 324 feet thick, embracing seven feet of coal, with two workable veins of 21 and 24 inches respectively, one of 12 inches, and the other six veins too thin to work. The lower coal measures are from 250 to 300 feet in thickness, in which are found five workable veins, varying from 1½ to 5 feet in thickness; the remaining seams vary from small streaks to 11 inches, making a total of 13½ feet of coal. From this it will be seen that the coal measures of Missouri reach nearly 1900 feet in thickness, with a total aggregate of 24 feet 6 inches of coal. Over so large an area of coal-bearing rock, it is but reasonable to expect that future developments will reveal regions containing coal of much greater thickness and value than at present experienced. The coal measures embrace sixty counties, but mining for the past year was prosecuted in only thirty-four counties, and in some of these the product was very small.

MODES OF WORKING.

There are but two systems proper for working the coal of this State—namely, the long-wall and room and pillar plans, or a modification of either. The long-wall system consists in the working off of the entire coal face, and the space in the mine thus left being filled up by its refuse material. To provide for and protect the roadways under this system, pack-walls are built along the side, requiring care and skill to be exercised in their construction. If these walls are not well built, or if they be constructed of material of a soft and friable character, the weight of the overlying rocks during the subsidence of the strata will crush and squeeze, thereby entailing much expense in keeping up the roadways. The long-wall method is followed where the conditions are favorable; the thinner the vein of coal and the more refuse it makes (speaking in general terms), the better it is adapted to this system of mining. This system is followed altogether in the counties of Andrain, Caldwell, Clay, Grundy, Jackson, Lafayette and Ray, and also in some of the mines of Henry, Linn, Macon and Randolph counties. But of all the above-named counties, the mines of Lafayette and Ray are the best adapted to the system; here the coal seam is underlaid by fire-clay, so suitable for under-mining, and overlaid by a good cap rock, with a foot of black slate coming down with the coal, and which slate furnishes excellent material for building walls along the roadways to support the roof. It was in the mines of the latter counties where the much-improved system of the movable face track was first introduced, and we believe that the credit for the same belongs to Mr. John Gibson, Supt. of the Richmond Coal Co. This movable face track is being generally adopted at all long-wall mines where it can be profitably used. The advantages of the long-wall over any method of working by room and pillar consists in the ability to work out the entire coal seam, the simplified and easy manner of extracting the same, and the opportunity offered for providing and maintaining ventilation around the entire works. When mines are deep, and the coal is reached only by a great outlay of money in sinking, this system of mining, even though it may cost more per ton than by the room and pillar plan, will save money to the operator in the end, by the greater yield of coal to the acre; in fact, there is no other system of mining by which a thin seam of coal can be worked profitably.

ROOM AND PILLAR METHOD.

The room and pillar system contemplates the driving of narrow entries, endways and crossways, in the coal, in advance, by which square blocks of coal are formed. Rooms are then opened only in the cross-entries, with a pillar of coal left standing between each room for the support of the roof; this method furnishes rooms or places for the employment of a large number of miners. The deeper the mine is opened from the surface and the thicker the cover over the coal, the greater is the crushing weight to which the pillars are exposed. Leaving large pillars in the mine entails additional expense in advancing the work, for the reason that the narrow work of entry driving is in all cases paid for extra, and the temptation is ever present to make the pillars too small for the sake of the larger and quicker return of profits.

There can be no established rule laid down for the proper thickness of pillars and width of rooms, by the pillar and room system of working, as the conditions existing and the circumstances surrounding the various districts are so widely different, and oftentimes in the same locality and in the same vein of coal, conditions vary greatly. In some mines the roof is so soft and brittle that wide rooms are invariably forbidden. In other mines, while the roof and coal is found hard and strong, yet the bottom is soft, wet and yielding; and should it prove that the pillars have been left too weak, sooner or later a crushing weight will creep on and close that part of the mine. So that the question of the thickness of pillars and width of rooms must after all be determined by the nature of the roof, the resisting power of the pillars, and the character of the coal and under-clay.

GASES MET WITH IN MINES.

There are no coal mines in existence entirely free from gas. The gases which are formed in coal mines are evolved from the coal itself, and its associated strata, also from the decomposition of organic matter, from mine fires and the incomplete combustion of coal, wood and powder. Carburetted hydrogen gas (fire-damp) is met with in several of the mines of this State, in small quantities, but at the Brush Creek mine, in Jackson, and the Waverly mines, in Lafayette counties, this life-destroying gas is found in dangerous quantity—several lives having already been sacrificed to it. Fire-damp has proven to be, without doubt, one of the greatest dangers to be encountered in mining. This gas issues from the pores of the coal, from seams in the floor and roof of the surrounding strata; and then again, it at times bursts forth

under great pressure in blowers. These sudden outbursts are extremely dangerous, for the reason that they so quickly fill the excavations of the surrounding vicinity, that men are liable to be suffocated by it before they are aware of their danger. When the gas is pure, or nearly so, it will not explode, but as it spreads and amalgamates with the air of the mine it renders the surrounding atmosphere dangerous, and should it come in contact with a light, an explosion is the result.

Being lighter than common air, the gas is always found in the upper portions of the mine, on top of falls, and in the highest workings, and gradually diffuses if left undisturbed. The principal object aimed at in modern mine ventilation is the removal of gas by air-currents, or to so dilute the gas as to render it non-explosive. When one part of fire-damp is mixed with fifteen parts of air, its presence can be detected by an elongation of a faint blue halo surrounding the flame of a lamp; when the mixture is one to twelve, it will explode, but the force of the explosion will be comparatively feeble. Nine or ten volumes of air to one of gas create the most violent explosive mixture; however, if more gas be added the mixture becomes less explosive, and when the proportion of one of gas to five of air is reached, it will neither explode nor support a light. When explosive mixtures are encountered in mines, the percentage of gas present must be judged by the action of the flame in the lamp, and by the general conditions revealed by the violence of the combustion inside the gauze. Mines located near the surface seldom, if ever, give off fire-damp in alarming quantity—it having escaped, doubtless, long ages ago, when the coal-beds were laid bare by the erosions of the land; but it is generally met with in great quantity in the deeper mines.

Corbionic acid gas (black damp).—This gas is produced in mines by decaying organic matter, by the burning of miners' lamps, the breathing of men and animals, and in connection with carbonic oxide resultant from the combustion of all substances containing carbon, and from fissures in the roof, sides and floor of the mine. This gas diffused through the air of a mine is perhaps ultimately more dangerous and deadly to the miner than even the fire-damp. It is insidious in its operation and kills the miner by inches; its immediate effects are headache, languor and general depression, and mines which do not give off any fire-damp are generally in worse sanitary condition than those which yield an inflammable gas. Where fire-damp exists in a mine, a sweeping current of air is generally made to travel its working face, in order to dilute the gas and render it harmless. But where black damp is generated in a mine, the main object in too many cases appears to be, not in sweeping the working faces with a sufficient cur-

rent of fresh air, as should be done, but in furnishing just such an amount of air as will prevent the miner's lamp from dying out. This gas is the heaviest of all mine gases; it is universally found in the lowest levels of a mine, and requires a strong current of air to remove it. It is invisible, incombustible and non-explosive, unfit for respiration, and a positive poison. It is dangerous to breathe an atmosphere containing eight per cent of this gas, and lights will cease to burn when ten per cent of it is present, and smaller percentages are injurious in proportion. It is found in large quantities in all mines and every man and boy working in a mine is familiar with it, because of its effect on the light.

Carbonic Oxide Gas, called White Damp.—This gas is the product and the result of combustion of coal and wood, and from powder explosions. It is never met with in mines, from natural causes. It is itself an inflammable gas, but does not support the combustion of other bodies. In mines where powder is largely employed to loosen the coal, miners often suffer from the effects of white damp. After a shot is fired, the miner can neither work nor live in the smoke from a blast, and is compelled to retreat until the same is diffused through the air; and when ventilation is poor, the smoke frequently hangs all day long in the mine in blinding and suffocating volumes. This gas has a more deleterious effect upon the miner than black damp, but unlike it in its non-support of a flame or light, as the miner's lamp will burn with great clearness, in an atmosphere made most deadly by the presence of white damp. It is the most dangerous of all mine gases to those who have had no experience with it. Three per cent of this gas mixed with the atmosphere of a mine will cause death, and in the event of its odor being detected by one experienced, a retreat to fresh air is instantaneous. One volume of this gas to seven of air, when ignited, will become a mass of flame, but the explosive force is weak except where large quantities are ignited, then the force of the explosive is terrific. This gas played a very prominent part in the explosions at the Rich Hill mines, and was doubtless a large factor in the destruction of life and property.

After-damp.—After-damp is the resultant mixture left after an explosion of fire-damp and air. No greater catastrophe can happen a mine than the explosion of a large amount of fire-damp. The burning air of such explosion rolls along the entries of a mine, scorching every living creature within its reach, and such portions of the mine as are beyond the reach of the flame are yet subject to the serious effects of the tremendous force of the explosion, which dashes the miner against

the sides of the mine, blows the stoppings out, breaking doors into fragments, and, in many cases, the cages in the shaft and the pulley-wheels above are blown high in the surface air. Then follows the after-damp, the product of the explosion, which travels the mine on a work of death to all beings exposed to it. It is a most poisonous gas, and very destructive to life; it is lighter than common air, and finds its way to the roof of a mine; is composed of $7\frac{1}{2}$ volumes of free nitrogen and one volume of carbon—in all $8\frac{1}{2}$ parts. In other words, after-damp is practically the air with the oxygen burnt out by the explosion.

VENTILATION OF MINES.

The ventilation of underground work remains one of the most important subjects claiming the attention of the mine manager. Upon the question of a suitable amount of air and the regulation and distribution of the ventilating currents, depend not only the successful prosecution of the excavations of a mine, but also the health and lives of those employed therein. The appalling accidents so frequently occurring from explosions of fire-damp and other causes, demonstrate the necessity for providing adequate and suitable provisions for the thorough ventilation of the mines, their working-places, road and passage-ways, and the necessity for which has been frequently forced upon the attention of those in charge of mines by legislative enactments.

The atmosphere of a mine, especially that of a coal mine, is liable to vitiation from numerous and uncertain causes, and it is subject to conditions of renewal altogether different from those prevailing on the surface. It is, therefore, of the first importance, and the duty of every mine manager, to give the closest attention to the condition of his mine, and see to it, personally, that the ventilative current is being properly circulated around the entire workings, direct from the down-cast or intake. Pure air is found only at the surface, and then only in places which are removed from sources of contamination, such as the hill-tops and high lands; in other localities a vitiation always exists to a greater or less extent, but when we descend into a mine, not only do we encounter the conditions existing as referred to in certain surface localities, where the polluting agents are most abundant and active, but the same conditions are greatly intensified. Hence it is that we often find the atmosphere of a mine laden with impurities and otherwise vitiated to a degree hardly fit to breathe.

We are sorry to admit that the ventilation in some of the mines of this State does not attain at all times to the standard required by the law, and there are various reasons for the defections existing. At some mines we find mine bosses wanting in the knowledge necessary to

provide for, regulate and properly distribute the ventilating current in and around the mine, and we often find them fully as careless in the performance of their duty as they are lacking in the proper experience; they seldom go into a mine, and, therefore, can have no knowledge or conception of its actual condition and requirements, and the injury being inflicted upon the miner.

With the above in view, and the knowledge of the fearful possibilities of incompetent mine management, I feel that I owe it to the miners of this State to most earnestly recommend the enactment of a law requiring all mine superintendents and bosses to pass an examination and secure a certificate of competency, before being allowed to take charge and supervision of mines where 10 or more men are employed.

The shallow coal or coal seams lying near the surface throughout the State being nearly worked out, operators will be compelled in the future to go deeper for the coal, and as more gas is encountered in deep mines than in those near the surface, the skill of the more practical mine superintendent will be demanded, and this we trust will do away with many of the so-called mine bosses of the present day. Defects in the ventilative current were discovered in several of the mines, which was due to lack of forethought in the construction of airways, in not making them large enough to admit the passage of a sufficient quantity of air, and want of attention in keeping the same clean at all times.

In the above cases the judgment and knowledge of the mine bosses were at fault, for all bosses should know that the greatest obstacle encountered in mine ventilation is that of small and contracted airways. Defects in the distribution of the necessary quantity of air in many of the mines may be traced direct to leakage through stoppings and break-throughs, and when such is the case the responsibility lies with the man in charge, who is either lazy or unfit in most cases. There are instances in this State where the mine bosses, although possessing the required energy and qualifications (yet being subject to a superior officer, who has acquired no mining experience, either practical or theoretical), and to hold their places become passive, allowing the judgment of the superior, who is influenced by selfish and economical motives, to override their better judgment. However, in several of the larger mines, much enterprise is displayed in the matter of improving the sanitary conditions, and in the additional security afforded the miners in other respects. It is only a short time since that, the mines in the vicinity of Rich Hill were considered dangerous magazines of explosive mixtures, and unfortunately sev

violent explosions at these mines occurred, causing great loss of life and property. By giving more attention to the important matter of ventilation, these mines are now perfectly safe, with sweeping currents of air flowing through them, and a practical miner in charge of each. All of the new mines which have opened up during the past year have adopted the much-improved method of ventilation: that of splitting the air-currents into separate divisions; and really this is the only practical method for the ventilation of extensive mines, and we are very glad to see this fact impressing itself upon the minds of mine owners. No part of the capital invested in coal mines yields better returns than that judiciously expended in securing proper ventilation.

Natural Ventilation.—A natural circulation of air through a mine is caused when there are two shafts or openings of unequal depth. The direction taken by the air-current is influenced by the difference of density in the two openings. In winter the current will be found to go down the shallow shaft and travel toward and then up the deeper one, but if the weather be very hot the conditions are reversed and the air-current goes down the deep shaft and up the shallow one. It is during the cold weather only that natural ventilation can be relied upon to be of any practical use in a coal mine.

But very few mines in this State are operated on this system of ventilation, and these are local mines, so termed because they operate only in the fall and winter for the supply of trade in the immediate vicinity.

Furnace Ventilation.—The action of the ventilating furnace is to strengthen the natural current by imparting an additional heat to the upcast column, thus reducing its density and lessening its weight, and by reason of which it rushes up the air-shaft, giving way to the heavier air, which in turn becomes heated in passing over the furnace. In this way a continuous current of cold air is made to descend one shaft and constantly force the warm air up the other. The furnace has long been the favorite ventilating appliance at coal mines, by reason of its simplicity and reliability. It is most effective in deep mines, as its power depends upon the amount of air to which its heat can be communicated, and the longer the column of heated air in the shaft in the proportion is the velocity of the ventilating current increased, as these conditions cause an additional length to the hot-air column, consequently a brisker ventilation is obtained. A wide furnace will do better service than a high one of same sectional area, as it admits of a thin fire over a larger surface, and the more effectually heats a large amount of air, as it is thus made to pass over it.

Fan Ventilation.—Fans have long been considered as affording the best method so far discovered, in producing a ventilative current in all kinds of mines; they are found to be far superior to the furnace as a ventilative power, and are now in very general use throughout the State.

In the ventilation of a mine, the action of the fan has the effect of reducing the weight of atmospheric air in the upcast—thus causing the air in the mine to expand by the consequent diminution of its weight in the space occupied. The difference between ventilation with a fan and that of a furnace, is in the method by which the equilibrium of the air in a mine is disturbed; the furnace causes the disturbance by expansion from heat, while the fan causes it from expansion by displacement. The efficiency of a fan depends largely upon its construction and the general surroundings.

There are several fans in use at the larger mines that are doing very effective work, while at other mines not one-fourth of the fan-power expended reaches its destination, owing to leakage through defective doors and stoppings. Still another fruitful cause of waste may be found at mines where the fan is located on top of hoisting-shafts, exhausting or forcing (as the case may be) through an air chamber, partitioned off from one end of main shaft, and in the effort to force the air current required through an area much too small for its accommodation, the flow of air is not only greatly retarded, but as the partitions are generally full of holes, much of the air is forced to the surface and lost, never reaching the bottom. Mine bosses are largely responsible for this, as many of them imagine that if a mine is furnished with a good fan good ventilation is assured, regardless of the surrounding conditions; when, at the same time, if they should take the trouble to investigate and find out the amount of air circulating at the face of the workings, not 25 per cent of the work done by the fan could be detected at the face.

It requires more than a well-constructed and effective fan to secure good ventilation; for without the co-operation of a practical mine manager (though the fan may liberally perform its part), who will see that doors are properly placed, hung and attended to, the airways kept large and clean, and the speed of the fan regulated in accordance with the demands of a mine, the miners cannot hope for a healthy atmosphere to work in.

Doors in Mines.—Much can be said concerning the importance of having well-constructed doors placed in mines; for even though the mine is equipped with a powerful fan or furnace for the supply of air, and it has large, clean airways, with a sweeping current of air com-

ing down the shafts, yet, unless this air is conducted and circulated around the mine by the use of well-constructed doors, perfection in the other appliances will avail nothing. It is practically impossible to make the doors perfectly air-tight; this being so, their employment occasions serious loss of air, and the loss is still further increased if they are not properly built and carefully hung. For these reasons, doors as much as is possible should be avoided. All doors should be made of heavy lumber, and if pine is used, they should be made double. In hanging doors, care should be taken to have them rest closely against the framing, in order to reduce the leakage as much as possible, and the framing should be inclined for the purpose of having the door close of its own weight. At all important doors a trapper should be employed to open them when required, and to close them immediately after the passage of a trip.

During the past year a number of poorly-constructed doors came under my notice, and not only was this the case, but they were also hung wrong, and having been made of one-inch pine lumber, they were continually kept partly open by the force of the air, and from this cause a large quantity of air was permitted to pass to parts of the mine, and in a direction where it was neither wanted or intended it should travel; the result being, that this loss in the volume of air robbed man and beast of the amount of air required and intended for each. Some of the mine bosses, when questioned as to their reasons for hanging doors in such manner as to shut against the air, as a rule replied that it was for the purpose of allowing the mule unaided, when passing with a trip, to open them, and thus avoid the employment of a trapper.

The canvas door has almost entirely disappeared from the main entries, and in many cases they have been replaced by the substitution of substantial wooden doors. Several of the larger mines have made such change in the system of ventilation as to entirely do away with doors on main entries. The least number of doors made use of in a mine, the better the ventilation, and although there will at all times exist a necessity for the use of doors in the distribution of the air current, yet the excessive use of them can well be avoided by splitting the air into several divisions and carrying the return over the intake by overcasts.

Mine superintendents and bosses should give this important feature of mine management their most earnest attention.

SAFETY-CATCHES.

Some very able authors, in writing on mining matters, claim that the safety-catch, under ordinary conditions, creates a false sense of security, and would rather prefer to depend on close inspection and prompt removal of doubtful ropes than on safety-catches. As far as the prompt removal of all poor hoisting ropes is concerned, I fully agree with the able author, as absolute safety is not claimed by the use of the safety-catches, and there is no certainty that they will invariably stop the falling cage, but are to be considered as extra safeguards that should never be omitted. The fact that the cage is provided with safety-catches does not relieve the engineer of any responsibility he might otherwise feel when hoisting or lowering men in the shaft, nor does it justify the use of doubtful ropes; without them, should the rope break, the cage is certain to go to the bottom, while with the catches on, the chances are greatly against it, and if this is all that can be said in their favor, it is a sufficient reason for their employment and an offset to all objections against them.

Riding up and down through shafts must be acknowledged as dangerous, yet statistics on mine fatalities prove that only one life is lost from the breaking of ropes for every 6,000,000 tons of coal raised in England and in the mines of Europe, where nearly all the coal is hoisted through shafts; and if by the use of safety appliances this ratio of danger can be reduced, it will be almost perfectly safe to ride in shafts.

The law requiring safety-catches upon cages is largely complied with in this State. There are various forms of catches in use, but the one most generally used at the shallow shafts is the chisel-shaped lever which cuts into the front of the guides if the rope should break or the cage be resting. Another form of catch has fangs, one on each side of the guides, and should the rope break, the fangs cut into the shaft timber and stop the cage. At the deep shafts, where large engines and a high speed of the cage is attained, a better and more complete form of safety-catch is used. These catches are sectors or cams having their faces serrated or toothed like a saw, and are keyed on shafts which are placed across the top of the cage frame, one on each side of the guide. Spiral spring is placed around the shaft, which throws the cams inward against the guides; springs are held back by a chain attached to the cage and the main clevis of the hoisting-ropes, so that weight of the cage becomes the power holding back and preventing the springs from acting. If the rope should break or it should slack when the cage is resting, the springs come into action and the

are thrown in, the teeth bite into the timber and are wedged tight by the weight of the cage; the guides being caught on both sides cannot split or be forced out of place. This is undoubtedly the best and safest form of catch now in use, and it is generally adopted throughout the State; but they require much attention to keep them in working order.

We are sorry to state that very few of the mine operators are giving proper attention to this important safety appliance. We often find the safety-catches properly constructed and appear to be all right, but on testing their usefulness we find the springs either broken or so weakened as to be utterly useless as far as the term safety is applied. We have endeavored to have all mine owners keep their safety-catches in proper working order, but have met with only partial success.

MINE MAPS.

There is no section of the law on the statute books of this State of more importance or beneficial to mine operators, than section 7061, R. S. of the mining law, which requires all mine operators employing ten or more men to make, or cause to be made, an accurate map or plan of their mines, and to add the progress and the extension of the same in January of each and every year. Yet there is no section of the law so grossly abused and violated as the above named section.

Last January a circular letter was sent out from this office to all mine operators, calling their attention to that section of the mining law, with a request to comply with the same. In response to this request a large number of paper parcels were received, with imaginary maps on some of them, which were very inaccurate and poorly drawn on common paper, with pencils, without boundary lines or scale, and were of no service whatever, to this or any other department, and only fit for the waste-basket.

Mine maps do not receive the attention their importance deserves, and mine managers are slow to realize their necessity. A good mine map will many times repay the operator for the outlay attached to it, in the trouble and expense it will save in various ways. It will show how much coal has been mined from a certain tract of land; it will show where new works can be opened up with safety in close proximity to old abandoned workings; it will serve to locate doors, cross-cuts and stoppings, and to distribute the ventilative current where it will serve the best purpose. In fact, no mine can be altogether operated successfully if not properly represented by a good accurate map.

In the near future the coal seams now being worked will become exhausted, and when this is the case, no doubt the lower coal seams

will be sought and mined, which will be a dangerous undertaking when the conditions of the old workings in the upper seams are unknown; and mine owners should realize this fact, and should spare no pains to have their maps as complete and as accurate as possible. An inaccurate map is almost useless, because it conveys the wrong idea of the directions of the workings, and forms an incorrect basis of estimate of amount of surface undermined. The prime object of a mine map is to show the underground workings in their relation to the boundary lines of the company's property, the amount of surface undermined, and what remains, and to serve as a complete record of all the workings.

Property owners, as well as mine owners, have, on many occasions, applied to this Department for information in regard to certain mines, with reference to the direction the mine had been driven and what portions of the surface had been undermined. Such information, no doubt, would be valuable to the applicants, and could readily be given if the operators of the said mine had complied with the law.

The 8th Annual Report of this Department, containing this statement on mine maps, will soon be printed, and a copy will be sent to every mine owner or mine operator in the State; and I hereby notify one and all to read section 7061 R. S. of the mining law, and to comply with the requirements of the same at once, or we will be compelled to resort to extreme measures.

REPORTS OF INSPECTION.

ADAIR COUNTY.

Production, 20,744 tons.

Adair county is underlaid by a large area of the coal measure formation, and mining is carried on in various parts of the county, but the most extensive mines are located at Stahl City, where one vein of coal crops out in the hills, and the mines are entered by drifts. A shaft has been sunk to the lower vein, and both veins will be worked this winter at the above-named city. Two workable veins of coal underlie nearly all the north and west part of this county, which has already attracted the attention of coal men, and thousands of acres have been bought and leased during the past 12 months. We expect to see Adair county one of the large coal-producing counties of the State in the near future. Three mines were operated here during the past year, descriptions of which are as follows:

KIRKSVILLE POSTOFFICE.

Pennsylvania Coal company, H. C. McCahan, manager, John Dawson, superintendent. This company is operating three mines in this county, all of which have shipping connection with the Q., O. & K. C. R. R. The mine at Danforth is a shaft 50 feet deep, steam power. Inspection was made December 4th, and the mine was found in rather bad condition. The north side of the mine had been abandoned, and the work was confined to the south side, which was making considerable water; the roof was very soft and hard to keep up. Too much of the shaft pillars had been taken off, making it unsafe to travel up and down the shaft. The communication between the hoisting and the escape-shaft was obstructed to such an extent as to make the traveling-way useless. The company was notified of these evils, and instructed to remedy the same at once. The latter part of January the company notified this department that it had closed down and abandoned the mine.

The mines at Stahl are drift openings, and ventilation is furnished by the aid of furnaces at each mine. No. 1 is the most extensive mine, and is fairly ventilated; but there is too much economy practiced here to consider the mines practically worked. The coal is from three to four feet thick, and worked on the room and pillar plan; it is underlaid with good slate roof; mining is done by pick work, as no powder is used. The mines are dry and the coal runs level. It is worked double-room, about 40 feet wide, and road on each side, two men to each room. The price for mining is \$1 a ton in winter and 80 cents in summer. A new air-shaft has been sunk on the north side of west entry, and is used as a downcast, which will give the men fresher air to breathe. The furnace will be moved and enlarged and the air will be divided into two parts—one current going around the north part of the work and another current to the south, and thence to the furnace. First inspection was made December 4; second, April 25, when there were about 60 and 30 men at work, respectively, on these dates.

Mine No. 2 was inspected on same dates. The thickness of the coal, mode of working and price paid for mining is the same as that of the other mine. The ventilation was found deficient in this mine on second inspection, but an air-course was nearly through at the time, which would improve it. This is a new mine opened out in the same hill the Ledford mine was located in, and the same seam worked. The coal is of a very fine quality, and is the same as that so extensively worked in Putman county, and throughout southern Iowa. The product of the mines is consumed by the railroad company at local towns along the line, and a large amount is shipped to Quincy. The same company was putting down a trial shaft at Stahl, at date of my last visit, and if coal is found in paying quantity, a shaft will be sunk at once and equipped with machinery. A new tipple has been built here and four new chutes to coal trains, and ten new houses for use of miners.

The Straup Bros. are sinking a shaft at Novinger, expecting to strike the same seam of coal as that at Danforth. The mine will be equipped with machinery. There are other mines in operation on Hazel creek, operating in the fall and winter to supply local demand. The coal at these mines is about four feet in thickness and of good quality, and will some day in the near future be worked more extensively than at present. The product is hauled now in wagons about eight miles, and consumed at Kirksville.

AUDRAIN COUNTY.

Production 43 910 tons.

Audrain is one of the few counties which show an increase in the output of coal during the past year. The county is all underlaid with the coal measures, and mining is carried on extensively at Farber, Laddonia, Martinsburg, Mexico and Vandalia. The same seam of coal is worked throughout the county, with the exception of the mine at Mexico, which is a pocket of coal recently found. It is 4½ feet in thickness and of very good quality for domestic purposes. Twelve mines were operated during the past year, descriptions of which are as follows:

FARBER POSTOFFICE.

Farber Coal Company.—W. Bethel, superintendent; mine located at Farber; shaft 104 feet deep; steam plant; and connected with the main line of the C. & A. R. R. The mine was formerly known as Sherman, Bethel & Smith; but in January, 1894, they reorganized into a joint-stock company under the above name. Two inspections have been made during the year; the first was on November 21, 1893, and second inspection was made March 29, 1894. On our second inspection we found that considerable improvement had been made since first visit. All of the entries had been made higher and widened out, and the airways cleaned. Ventilation is produced by a furnace, which was giving good results. Coal runs from 24 to 30 inches in thickness, overlaid with a good, strong, black slate, well adapted for the long-wall method of working, which is used; very little timber is required. Ropes, cages, safety-catches and gates in good repair; the product is consumed at local towns along the line of the railroad; from 15 to 25 men employed.

LADDONIA POSTOFFICE.

Laddonia Coal Company.—C. Turpin, superintendent; mine located at Laddonia; shaft 45 feet deep; horse power; coal 26 inches thick, and worked on the long-wall plan, employing from four to eight men in fall and winter, to supply local demand. The coal from this mine is consumed at Laddonia and the immediate surroundings.

C. P. Eastham operates a mine southeast of Laddonia; shaft 32 feet deep; horse-power; mine only operated in fall and winter, giving employment to a few men to supply the home trade.

A. Weber opened a new mine in the fall of 1893; shaft 40 feet deep; horse-power; coal 26 inches thick, and worked on the long-wall plan, giving employment to three men in fall and winter to supply the local demand. There are several others operating mines on a small scale in the surroundings of Laddonia to supply the local trade.

MARTINSBURG POSTOFFICE.

W. T. Taylor & Co. successors to Martinsburg Coal Co. since June 13, 1894.

Martinsburg Coal Company.—John Catlize, superintendent. Mine located $\frac{1}{2}$ mile east of Martinsburg, and connected with the Wabash railroad; shaft 107 feet deep and equipped with very fair machinery for hoisting. Two inspections of this mine were made during the fiscal year. First inspection was made November 15, and the mine found in very fair condition, with ventilation up to the requirements of the law; but the cages were found without catches or covers, nor were there any gates around the shaft openings. The escapement shaft, the sinking of which was commenced in August, 1893, was down 40 feet and stopped. Instructions were given to the company to resume work on the escape-shaft at once, and also to comply with other requirements of the law in the safety appliances.

March 26th I visited the mine again, and found that the cages had been supplied with safety-catches, but no bonnets had been put on and no work had been done on the escape-shaft since my former visit. I notified the company that the escape-shaft must be completed within sixty days, and other requirements of the law complied with or I would close the mine. June 14th, W. T. Taylor bought the mine, and notified this Department that the escape-shaft would be sunk at once. Ventilation was being produced by a little fire near the bottom of hoisting-shaft and which would be dignified too much by calling it a furnace. Very little air was found in the mine and the airways too small in places. Instructions were given to have the airways cleaned and enlarged. Coal runs from 24 to 32 inches in thickness, and is worked on the long-wall plan; from 25 to 40 men employed; coal consumed at local towns along the line of the railroad.

MEXICO POSTOFFICE.

A very extensive pocket of coal was discovered one mile east of Mexico, in the summer of 1893, on the land of C. C. Davies. A shaft was sunk and struck coal at a depth of 42 feet. The coal is of a very good quality, clear of sulphur or pyrites, and an excellent coal for domestic purposes. It will average 4 feet in thickness. The coal is underlaid with clay mining, proving, according to the theory of geology, that it is a native of its present location. The roof is a soapstone, rather soft, but easily secured by timber. I made a close observation of this coal deposit, and all the indications go to show that it is a very extensive pocket of coal.

The mine is only operated in a small way at present, but preparations are being made to work on a larger scale. From 10 to 15 men have been employed through the fall and winter, and the product finds a ready market at home, in Mexico and the immediate vicinity.

MT. CARMEL POSTOFFICE.

Omer Detienne is operating a mine at Mt. Carmel; shaft 32 feet deep; horse-power. This is the same seam of coal as that worked at Vandalia and other parts of the county, and is worked after the same method. Mine only operated in fall and winter to supply home trade.

VANDALIA POSTOFFICE.

Vandalia Coal company, Wm. Bevan, president.—Mine located one mile west of Vandalia, and connected with the Chicago & Alton railroad. Shaft 75 feet deep, and equipped with very good machinery. Ventilation produced by a 10-foot fan, which was giving good results. First inspection was made Nov. 18, and mine found in good condition, with a good current of air passing along the face of the workings. Second inspection was made March 28th, and I found that the requirements of the law were closely observed and obeyed. Coal 30 inches thick, overlaid with strong black slate roof; well adapted for the long-wall method of mining, which is used here. The mine is dry with good high roadways, and in good condition.

The product is consumed by the railroad company, which is taken out of the chutes erected at the mine to coal engines. From 50 to 60 men and boys employed; mining is paid for at the rate of 86 cents per ton. Thos. Morgan, superintendent.

Audrain Manufacturing and Coal Company, C. Dixon, superintendent.—Mine located at Vandalia; shaft 65 feet deep; steam power used for hoisting. Formerly this mine was owned and operated by the Audrain Brick and Manufacturing Company, but in July 1893, it was purchased by the Vandalia Coal Company, which company is operating the mine at present. Considerable improvement has been made inside and out at this mine since the present owners took charge; the old engine was taken out and a larger one put in its place; the old pit-head was taken down and a new one erected, and a new engine house has also been built. All the entries have been made higher, timbered and cleaned, and the mine is in much better condition than formerly. The coal is 30 inches in thickness, overlaid with a good slate roof and worked on the long-wall-plan; 86 cents per ton paid for mining. The clay is worked in another part of the mine on the room and pillar system, leaving the coal for roof. Both coal and clay mines are venti-

lated by the same furnace, which was giving good results at both dates of inspection, November 18 and March 28. The coal is consumed at the mine for the manufacture of brick and other articles, and to supply the home trade. This plant gives employment to about 50 men and boys. Jacob Williams is superintendent of the mine.

BARTON COUNTY.

Production, 55,767 tons.

Coal is mined in nearly every township in this county, but only on a limited scale. The most extensive mines are located at Liberal, Minden and Vernon station. A very large portion of the coal mined in this county is obtained by stripping, underground mining being impractical owing to the shallowness of the covering. The output shows a decrease of 5534 tons as compared with the previous year, which is due to the recent strike of the miners. Fourteen mines were operated during the year, but most of them are small and only operated during the fall and winter to supply home demand. The product of the large mines is taken to market over the Missouri Pacific and Kansas City, Fort Smith & Memphis railway. Following is a description of the principal mines, with their sanitary condition, as found on dates of inspection:

LIBERAL POSTOFFICE.

Betz Bros. are operating a mine at Liberal, connected with the K. C., Ft. S. & M. R. R. Drift opening and worked on the pillar and room plan. Coal 30 inches thick. The product is shipped to points north and consumed at towns along the line.

D. Cox, drift opening; operated in fall and winter to supply home demand.

Larry Bros. operate a mine near Liberal, on the Boulware land, to supply winter trade.

Hefton & Brown, drift opening; operated in fall and winter to supply home demand.

Fuller Coal Co. has opened a mine north of Liberal. Drift opening. The coal is hauled in wagons and loaded on cars at Liberal. Mine not running at date of my visit; hence, no inspection made.

Liberal Coal Co., J. G. Loddell manager. Mine located half mile south of Liberal and connected with the Missouri Pacific railway by a switch. Drift opening. What little air was in the mine was produced by the natural current, as no mechanical appliances have been put in here to assist ventilation. The mine was also wet, muddy, and in bad condition. The mine is entered in the side of a hill, and the coal deposit is small, and before the present report reaches the hands of its readers it will be worked out and abandoned.

MINDEN POSTOFFICE.

State Line shaft—S. H. Lanyon, owner. This is the mine which was formerly operated by C. H. Morgan. It is located one mile southwest of Minden, and connected with the Kansas City, Fort Smith & Memphis railroad. Shaft 45 feet deep, and operated by steam-power. Ventilation is furnished by a 10-foot fan, which was expending considerable power and giving very poor results, owing to the poor construction of the fan, and the small contracted airways. On first visit to the mine, October 10th, it was full of water. May 14th I visited the mine again, and made a careful examination, and found deficiency in the ventilation, in all parts; in fact, there was no air in the mine. Roadways wet and muddy, and the mine in poor condition. Instructions were given to the company to sink another air-shaft, at face of workings, or clean up the airways. The mine was operated on this date by Miller Bros., who had leased it from the owner.

Coal about 3 feet thick, and worked on the pillar and room plan. Fifty (50) cents per ton is paid for mining run, of mine. Employment is given to about 25 men. Coal shipped to points north and south.

The Sunshine mine is located near Minden, connected with the K. C., Ft. S. & M. railroad. Shaft 45 feet deep; steam-power. This mine was formerly operated by the Wear Coal Co., but in the summer of 1893 they moved the machinery and abandoned the mines, but in November of the same year another party took charge of the mine, built a pit-head, put in machinery, and is operating the same at present. Ventilation is produced by a fire-basket, which was inadequate to properly ventilate the mine, and a furnace will be built. Coal is 3 feet thick, worked on the room and pillar method. About 15 men employed. Coal shipped to Kansas City and points south.

Wear Coal Co.—A. B. Kirkwood, superintendent. Mine located at Vernon station, 3 miles north of Minden, connected with the K. C., Ft. S. & M. railroad. Shaft 45 feet deep; equipped with good machinery for hoisting, draining and ventilation. This is a new mine, sunk in September, 1893. The machinery, pit-head and houses were moved from the Sunshine mine, west of Minden, and put up at this mine. A careful inspection was made of the mine May 15, and it was found in good condition. The ventilation, which is produced by a 10-foot fan is split at shaft bottom to east and west sides, and is conducted to the north and south entries, circulating a good current of air to all the working places. An escapement-shaft has been sunk and partitioned into two compartments, one for the air to travel and a stairway erected in the other for the men to travel in and out of the mine, as no one is

allowed to ride on the cages. Coal about 3 feet thick ; worked on the room and pillar plan. Fifty (50) cents per ton is paid for mining unscreened coal. Shot-firers are employed here to fire all shots after the miners retire from the mine. Employment is given to about 75 men. Coal shipped to Kansas City and other points.

Jake Arnel is stripping coal near Minden to supply the local demand.

Frank Gray operates a strip-pit in same locality.

Joe Short is operating a drift mine near Minden.

M. Short is operating a mine near Minden. Shaft 30 feet deep ; horse-power. Coal consumed in the vicinity.

As the covering over the coal is so shallow, it is not practical to mine the same, and during the fall and winter the farmers turn in and scrape off the dirt and take out the coal and ship it to market.

BATES COUNTY.

Production, 291,271 tons.

The causes leading to the large falling off of the coal product in this State in the aggregate, while directly traceable in most of the coal producing counties to the strikes and general stagnation of business, cannot be attributed as the sole cause of the large decrease in Bates county. The causes referred to had their influence, but the main cause in this county is attributable more largely to the fact that two of the largest coal companies in the State, having exhausted the coal on the land located within the limits of the county, have opened new mines in the same coal-field, in the immediate vicinity of Rich Hill ; but, unfortunately for Bates county, just far enough away to cross the line and locate the new mines in Vernon county. This county, during the year ending June 30, 1886, produced 729,633 tons of coal, and held the lead of all the counties until 1892, in which year Macon county took the lead and continues to hold it. As may be seen from the tables in this report, Bates county mined during the year 1893 (ending June 30), 627,514 tons, and for the year 1894, ending as above, only 291,271 tons were mined, showing a decrease or falling off in production amounting to 336,243 tons. As showing the relative decrease of this county, compared with the balance of the State, it will be found that the total decrease of the coal production amounts to 807,120 tons, and that the falling off in Bates county alone equals nearly 42 per cent of this large decrease. During the year 43 mines have been operated, of which 5 are shafts, 10 slopes, 3 drifts, and 25 are strip-pits. These mines are operated by the use of 6 steam plants, 11 horse-powers and 1 hand-power. In all underground work the pillar and room system is uni-

versally practiced. Powder during the past year cost the miners \$23,934, there having been 12,330 kegs consumed. The number of men employed on an average winter and summer, was 550 miners and 238 other employes. The casualties of the past year were three fatal and three non-fatal accidents.

The coal product of this county is taken to market over the Missouri Pacific railroad, which passes through the center of the coal field.

Following is a description of the mines and a statement as to their conditions, as found at dates of inspection :

AMORET POSTOFFICE.

The coal in the vicinity of Amoret varies from 2½ to 3 feet in thickness, and is overlaid with a soapstone roof. The shallowness of the covering over the coal makes impracticable any system of underground mining in this locality. At present, nearly all of the mines of this section in operation have been abandoned, and that, too, before one-tenth of the field was exhausted; however, stripping has been resorted to by many of the former operators.

Black Diamond Coal Company operates a mine about half-way between Amoret and Worland. The mine is entered through a drift; the coal is over 3 feet in thickness and is worked on the room and pillar plan. The product is hauled in wagons and loaded on cars, and shipped over the K. C., Ft. S. & M. railroad.

FOSTER POSTOFFICE.

The coal in the vicinity of Foster is the same seam as that worked at Amoret, and is about 3 feet in thickness, with a very shallow covering, making underground mining impracticable as well as unprofitable. The coal is obtained by stripping off the overlying surface first, and then quarrying the coal; it is then hauled in wagons to the railroad and shipped to market over the Mo. Pac. railroad.

There are between 15 and 20 strip-pits operated in the vicinity of Foster, and the name and output of each and every mine will be found in the statistical table of this county.

HUME POSTOFFICE.

Thos. Manchester & Son.—Mine located at Hume, and connected with the K. C., Ft. S. & M. railroad. Shaft 70 feet deep; horse-power. This is a new mine, sunk in the fall of 1893, and very little work had been done up to date of my visit, January 13th. Coal about 28 inches thick, worked on the room and pillar plan; and from 6 to 10 men employed.

The following named parties operate strip-pits north of Hume, and haul the coal to the railroad, and ship it to Kansas City and other points: E. H. Thurman, Deering & Johnson, Horton & Davies and W. S. Shaw. Each of the above named parties are operating the same seam of coal.

RICH HILL POSTOFFICE.

Rich Hill is located near the southwest line of Bates county, and is noted for its large and valuable coal deposits. While coal has been mined for local purposes throughout Bates county for a great number of years, yet, about the year 1880, when capitalists entered the field and opened out extensive mines, and from that year to the 30th of June, 1894, my estimate of the product of the mines will justify me in the statement that 10,000,000 tons of coal have been taken from the bowels of the earth within a radius of 5 miles of Rich Hill. Her mines within the radius mentioned are as productive today as ever, and the coal field is almost inexhaustible.

Three inspections have been made of all the mines in the surroundings of Rich Hill during the past fiscal year, and the location and condition of each mine was found as follows:

Bruce and Mandville mine, located about four miles north of Rich Hill, and south of Gulf No. 5. Drift opening from the bottom of a strip-pit; ventilation is furnished by a small furnace, which is located on the outside of the mine, and exhausting through an 18-inch circular pipe. The ventilation was found deficient, and instructions were given to the company to sink another air-shaft and build another furnace. This mine is driven toward an old abandoned mine which is full of water, and the company were instructed to keep bore-holes 20 feet ahead of all the other workings. Coal from four to four and one-half feet in thickness, and worked on the pillar and room plan. The output being hauled on a tram-road to a switch having connection with the K. C. Ft. S. & M. R. R., over which it is shipped and consumed at Kansas City: and points north and south.

S. W. Hopkins is operating a drift and a strip-pit, near Rich Hill. The coal is from 5 to 6 feet thick, and is hauled in wagons to railroad switch and is shipped to market over the Mo. Pac. R. R.

Martin, Gee & Ferguson mine, located northeast of Rich Hill, on the Spencer land, has a shipping connection with the Mo. Pac. R. R. Coal is brought out through a drift, and mine ventilated by a small furnace. Coal about four and one-half feet, and worked on the pillar and room plan. The mine is surrounded by old abandoned strip-pits, and has several outlets to same, and after every heavy rain the mine

fills with water and stops operations; employment is given to about 25 men.

Peter Pearson operates a strip-pit near Rich Hill; the coal is hauled to railroad switch in wagons, and shipped to market over the Mo. Pac. R. R.

Contract mine, operated by D. Rees, located 4 miles north of Rich Hill; slope opening, and the product is brought to the surface by steam-power. Ventilation is produced by a 10-foot fan, which was giving good results. Coal about 4 feet thick, and worked on the pillar and room plan; from 40 to 50 men employed.

Rich Hill Coal and Mining company, Major R. M. Reavley, general manager, and J. T. Reavley, general superintendent. This is one of the largest coal companies in the State; the output of its mines constitute one-sixth of the coal production of the State. All of its mines are worked on the double entry room and pillar method, and the coal is mined by blasting it off the solid. The coal varies in thickness from $3\frac{1}{2}$ to 5 feet, and 50 cents per ton is paid for mining unscreened coal. Ventilation is produced by fans, and the mines are well ventilated and well managed. Three inspections were made of each mine during the past year, and their condition found as follows:

Mine No. 4 is located 3 miles northwest of Rich Hill; slope opening; the work during the past year has been confined to drawing pillars, and on my third visit to the mine, I found men taking out the track, and the mine is now abandoned.

Mine No. 13 has been worked out, and the houses and equipment of the same moved to the company's mines south of Rich Hill.

Mine No. 15, E. Allison, foreman.—Mine located 2 miles south of Rich Hill, and connected with the Mo. Pac. R. R. by a switch; shaft 106 feet deep, and equipped with first-class machinery for hoisting and ventilating. This is the largest coal producer as well as the best equipped mine in the State; in fact the output of this mine exceeds the coal productions of 20 counties, and the output would have been considerably larger if the demand for coal would have justified the mine being run to its full capacity. A 15-foot fan is furnishing the ventilation, which was making 75 revolutions per minute, and removing 56,350 cubic feet of air in same time, which was conducted around the working in 5 separate currents, and each current ventilating a different part of the mine; thence returning to the upcast over air-crossings. I made a careful examination of all the abandoned workings and found them clear of gas, and a good current of air traveling through. There were 245 men and boys employed at date of this visit, October 5th, and the mine had a daily output of 1400 tons of coal.

Second inspection was made January 11, and owing to the depression in the coal trade, the mine was only running about one-half the time; but the day hands are always found at work in the mines of this company, making repairs and keeping the mine in good working order. Third inspection was made May 11, and the mine was found in good condition, with the requirements of the law closely observed and obeyed. As the coal is mined by blasting off the solid, a very large amount of powder is used, but every precaution is taken to avoid accidents; the sanitary conditions of the mine and the safety of the men are well looked after; shot-firers are employed by the company to fire all shots after the miners retire from the mine; gasmen are also employed, whose duty it is to go around the working every morning, examine all working or suspicious places, and report that everything is safe before the miners are permitted to enter the mine. The coal is from 3½ to 5 feet thick, overlaid with good slate roof, easily secured with timber; mine dry, with good high roadways and in good condition generally.

Mine No. 18.—I. B. Watson, foreman; this is a slope opening from the bottom of the strip-pit, and the product is brought to the surface by steam-power; ventilation is produced by a 10-foot fan, and the mine is well ventilated. The coal varies in thickness from three to four feet, and is very faulty; from 40 to 50 men employed, and the coal is shipped over the Missouri Pacific railroad to Kansas City and points north and west.

Contract Mine.—Operated by J. M. Wise; it is located about three miles north of Rich Hill; slope opening, and the coal is brought to the surface by steam-power; ventilation is produced by a 10 foot fan. First inspection was made October 9, and a deficiency in the ventilation was found at the head of the workings, owing to the leakages in the doors and stoppings. The attention of the company was called to the matter, with instructions to remedy it at once. Second inspection was made January 10, and only one part of the mine was working, owing to water breaking in from old abandoned mines. I visited the mine again on May 12, found it idle and the miners on strike, so no inspection was made; coal from four to five feet thick, worked on the room and pillar plan, and employing about 40 men.

Wm. Sullivan is operating a drift mine and a strip-pit, 1 mile south of Rich Hill, and has shipping connections with the Missouri Pacific railway, over which road the product is taken to market.

J. M. Harrison is stripping coal near mine 18 and loading the coal on cars and shipping to market over the Missouri Pacific railway.

J. B. Williams, strip-pit, north of Rich Hill. Coal hauled in wagons and shipped to market over the Mo. Pac. railway.

McMahon & Page, strip-pit, northeast of Rich Hill, and shipping the product to market over the Mo. Pac. railway.

Frank Martin, strip-pit, located north of Rich Hill. The coal is hauled in wagons, loaded on cars and shipped to market over the Mo. Pac. railway.

R. E. Allen is operating a strip-pit east of the Sullivan mine, and hauling the coal in wagons, loading on cars at Rich Hill and shipping to Kansas City over the Mo. Pac. railway.

Chenney & Beatey operate a strip-pit south of Rich Hill, and ship over the Mo. Pac. railway.

ROCKVILLE POSTOFFICE.

A large deposit of coal is worked about 6 miles northwest of Rockville, which runs in thickness from 5 to 6 feet, but owing to the shallowness of the covering over the coal; under-ground mining is impractical, and the coal is obtained by stripping off the dirt and slate, and quarrying the coal.

Other veins of coal are supposed to exist in this locality, and considerable prospecting has been done here lately by different parties, and I have no doubt but an extensive mine will be opened here as soon as railroad connection can be had to the mines.

John A. Ford operates a strip-pit, located 6 miles northwest of Rockville; the coal will average $5\frac{1}{2}$ feet in thickness, and is consumed in the surrounding country.

D. D. Peeler operates a strip-pit in the same locality. The coal is about the same thickness as that of the other mine, and is consumed in the immediate neighborhood.

As these mines are located away from shipping facilities, the output is confined to the local demand.

WORLAND POSTOFFICE.

The same seam of coal is worked in the surroundings of Worland, as that of Amoret and Foster. It is about three feet in thickness, but has a very shallow cover over it, and is very faulty. Most of the coal is obtained by stripping off the overlying surface, and quarrying it out. All the coal from these strip-pits is hauled in wagons to the railroad and shipped to market over the Mo. Pac. R. R. There are about 20 strip-pits in the surroundings of Worland. Some of them are large producers. The names of all operators, and the output of each, will be found in the statistical table of Bates county.

F. A. Raney & Company operate a mine one mile east of Worland, at Ward's switch; shaft 40 feet deep; horse-power; coal 3 feet thick; worked on the pillar and room plan; ventilation produced by a furnace giving very fair results. Coal is hauled from the mines in wagons, loaded on cars at Ward's switch, and shipped to market over the Mo. Pac. R. R. Employment is given to about 15 men.

Thomas Manchester & Son operated a slope in the same locality the fore part of the winter, but have since leased the mine to other parties. Very little work has been done at the mine during the year.

BOONE COUNTY.

Production, 19,038 tons.

Boone county is underlaid by the Coal Measures, and mining operations are carried on in a small way in different parts of the county. The same seam of coal so extensively worked in Macon and Randolph counties is found and worked. Twelve mines were in operation during the past year, producing in the aggregate 19,038 tons, which is a decrease of 6564 tons compared with the previous year's output. The amount realized from the sale of the product was \$28,428, an average of \$1.49 per ton at the mines. For a description and location of each of the mines operated, see remarks following:

CENTRALIA POSTOFFICE.

L. Severs is operating a mine 3 miles north of Centralia. Shaft 30 feet deep; horse-power; coal about 2 feet thick, and worked on the long-wall method. It is hauled in wagons to Centralia, where it is consumed.

COLUMBIA POSTOFFICE.

There are a great number of mines in the surroundings of Columbia, operated in the fall and the winter to supply home trade. B. S. Benefield operates a mine 3 miles northeast of Columbia. Drift opening; coal 3½ feet thick; worked on room and pillar plan; mine operated in fall and winter.

Blackfoot Coal Co., formerly known as the W. A. Gooding Co.— Mine located 5 miles north of Columbia, on the Gravel road. Shaft 120 feet deep; horse-power. This is a new mine sunk in the fall of 1893, when a 4-foot vein of coal was struck at the above-mentioned depth. The coal is of good quality, and is the same seam as that so extensively worked in Macon and Randolph counties. The roof is a hard slate, requiring very little timber. The coal is hauled in wagons to Columbia, where it is consumed, and consequently the capacity of the mine is limited to the local demand; while it could be operate

very extensively, if it had railroad connection to ship the product to other markets.

Carter & Smith.—Mine located 4 miles north of Columbia. Shaft 20 feet deep; horse-power. Coal $3\frac{1}{2}$ feet thick and worked on the room and pillar plan. The roof is soft and requires great care to keep it secure with timber. Coal hauled in wagons to Columbia, where it is consumed.

Columbia Coal Company.—E. L. Hubbard, superintendent. Mine located 4 miles north of Columbia, at Henry station. Shaft 120 feet deep, equipped with steam-power for hoisting.

This mine changed hands in the summer of 1893, and the present operators took down the horse-power apparatus and built a new pit-head, and moved the cages, ropes and machinery to this point from a mine in Randolph county, and through these improvements increased the capacity of the mine. Ventilation is produced by a fire basket, located at the foot of the air-shaft, which is inadequate to ventilate the mine with its present force. The company has been instructed to build a furnace. Coal about $3\frac{1}{2}$ feet in thickness, and is worked on the long-wall plan. The soapstone, forming the roof, is soft and friable, and very difficult to keep it secure, requiring a large amount of timber to be used. The mine is connected with the Columbia branch of the Wabash railway, which road consumes the entire output of the mine. About 30 men employed.

Thomas Rees is operating a mine near Columbia to supply local trade.

George Kimball, drift opening, supplying home consumption.

Scott Gordon, mine located in the vicinity of Columbia; operating in winter to supply home trade.

Will Mortica operates a mine in the same vicinity, to supply home demand.

James Rouse operates a mine three miles from Columbia, supplying the home trade.

John Goffett, drift opening; supplying local trade.

Paul Wright operates a mine to supply winter trade.

Arthur Clarkson, drift opening; supplying home demand.

Sam Sublett operates a mine to supply home demand.

BROWN STATION POSTOFFICE.

James W. Gaither operates a mine near Brown station during the winter months to supply home trade.

M. C. Pedro operates a strip-pit near Brown station; coal consumed in surrounding vicinity.

George Rogers, drift opening, supplying home trade.

Walter James operates a mine near Brown station to supply local demand.

There are other mines operating in the surrounding country in the fall and winter. Thickness of coal and mode of working and price paid for mining are the same at all the mines.

CALDWELL COUNTY.

Production, 22,869 tons.

The coal product of Caldwell county has shown a large decrease during the year ending June 30, 1894, as compared with the previous one. During the past year 22,869 tons of coal were produced, and sold for \$41,018, or an average of \$1.79 per ton at the mine. And for the same period in the preceding year 29,020 tons were mined, which was sold for \$57,749.75, or an average of \$1.99 per ton, thus showing a decrease of 6151 in tons, and 20 cents per ton in the amount received for the output. Four mines were operated part of the year, working on two different veins of coal.

The East Hamilton mine is working the lower seam, while the Kingston and Tom Creek mines are working the upper vein; the Cowgill mine has been abandoned.

Following is a description of the mines and the condition in which they were found at dates of inspection :

COWGILL POSTOFFICE.

Cowgill Coal Company.—W. H. Revis, superintendent. Mine is located 2 miles west of Cowgill, connected with the C. M. & St. Paul railroad. Shaft 340 feet deep; steam-power used for hoisting.

The coal runs very irregular and faulty, and varies in thickness from 5 to 20 inches, which makes the mine an unprofitable one to operate and difficult to compete with the product of other mines.

The ventilation was found deficient; in fact, there is no system of ventilation practiced here, and everything else about the mine was found badly neglected and in poor condition. March 31, I received a letter from Mr. Revis, stating that the track had been taken out and mine had been abandoned.

HAMILTON POSTOFFICE.

Caldwell Coal Company, E. B. Hayden, president.—Mine located two miles east of Hamilton, connected with the Hannibal & St. Joe railroad; shaft 507 feet deep; equipped with very good machinery for hoisting; ventilation is produced by a 10-foot fan, set on top of

air-shaft. Two inspections were made of this mine during the past fiscal year, December 8 and March 13, and on both of these visits the fan was stopped and the mine supplied by natural ventilation, which was furnishing sufficient amount of air and which was fairly distributed around the workings. The airways had been widened out and enlarged since my former visit, and a larger volume of air was found travelling. The coal is about 18 inches in thickness, and runs very regular; it is underlaid with fire-clay; the roof varies in the character of its formation with either shale, soapstone or sandstone overlying the coal, which makes a very good roof, and one well adapted for the long-wall method of working which is used; the entries are wide, high and dry, and the mine was found in very good condition on both visits; about 70 men employed; most of the coal is used by the railroad company.

Hamilton Coal Company, J. W. Hines, superintendent. — Mine located about 1½ miles south of Hamilton, connected with the Hamilton and Kingston railroad. Shaft 310 feet deep; using steam-power for hoisting; ventilation is furnished by a 10-foot fan.

Inspections were made December 8 and March 13; on first inspection a deficiency was found in the ventilation on the west side, and instructions were given to the superintendent to clean up the airways, so as to admit a sufficient amount of air to ventilate the mine.

On second inspection I found some improvement in the ventilation, but still somewhat deficient. The attention of the superintendent was again called for further improvement. The mine has been in operation for a number of years, and the entries have been driven a long distance from the shaft without a practical method of ventilation. The air at this mine is conducted by a very small air-course through the face of old and abandoned workings, full of bends and angles, over stagnant water, and where the settling of the roof is constantly in action, making the area so small that it is almost impossible for any air to screen through. I cannot too strongly condemn such a system of carrying the air, and I hope that mine bosses and superintendents will learn and practice the more modern and improved methods for the ventilation of mines. Coal is from 15 to 28 inches in thickness and worked on the long-wall plan. Mine fairly drained, with good, high roadways. About 30 men employed. Product consumed at Kansas City, St. Joe, and at local towns along the line of the Hannibal & St. Joe railroad.

KINGSTON POSTOFFICE.

Kingston Coal Company.—Thos. Berris, superintendent. Mine located 1 mile north of Kingston. Shaft 247 feet deep, equipped with good machinery for hoisting. Ventilation is produced by a steam jet set at bottom of shaft, exhausting through an air-chamber, partitioned off one end of hoisting shaft. While the much improved methods of modern appliances for the ventilation of mines make the use of the appliance here employed look crude, yet, for the present capacity of the mine, the ventilation is satisfactory. The coal runs very irregular and faulty, and varies in thickness from 8 to 26 inches.

First visit was made to this mine July 11, 1893, and the company was notified to sink an escapement-shaft at once. July 31 this department was informed by this company that they had made arrangements to sink the escape-shaft, and that work would be commenced at once. I visited the mine again on the 8th of December and found the work on the escape-shaft had been stopped; in fact, very little work had been done. The company made me many fair promises on this visit, that the work on the escape-shaft would be resumed at once, and the same be pushed with all possible speed until completed. March 13 I visited the mine again, and found that no additional work had been done on the escape-shaft since my former visit. The prosecuting attorney of this county was instructed to bring suit against the company for violating section 7063, R. S., of the mining law of the State, and the mine was temporarily closed. On the 11th of June I made another visit to this mine and found 14 men at work, but nothing being done in the way of sinking the escapement-shaft. On the advice of the prosecuting attorney, I called on the officers of the company and made an agreement with them, in the presence of the prosecuting attorney, that work had to be resumed on the escape-shaft at once, and be pushed with all possible speed until completed, and October 1, 1894, was fixed upon as the limit of time for its completion.

Early in July I visited the mine to see what progress was being made on the shaft, and found it down about 30 feet and only a single shift working. I notified the company at once that it must put more force on the escape-shaft or I would close the mine, as the shaft was not going down fast enough to suit me; to which the company replied that another shift would be started as soon as water was struck. The following notice was posted in a conspicuous place at the mine:

NOTICE.

To the miners of the Kingston Coal Company: I deem it my duty to inform you that I have condemned the Kingston Coal Company's mine, as operating in direct opposition and in violation of the mining laws of the State of Missouri. The company has failed to comply with section 7063, Revised Statutes, requiring an escapement-shaft to be sunk. All persons hereafter engaging in work in this mine must do so at their own risk and personally assume the responsibility for such acts, as I shall hold myself blameless for any accident that may occur.

CHAS. EVANS,
State Mine Inspector.

CALLAWAY COUNTY.

Production, 23,223 tons.

The coal production of Callaway county shows a slight decrease, as compared with the output of the preceding year. Twelve mines were operated during the year, but most of them are small and only operated through the winter season to supply the local demand. These twelve mines produced 23,223 tons of coal, which was sold for \$36,636, or an average of \$1.58 per ton at the mine. Descriptions of the mines are as follows:

FULTON POSTOFFICE.

Wm. Castle is operating a mine southeast of Fulton. Drift opening and worked on the room and pillar plan. Coal about 28 inches thick, and \$1 10 per ton is paid for mining. Coal consumed at Fulton.

Ed. Curd operates a mine south of Fulton to supply the home trade. The mine is entered by drifts and worked on the room and pillar plan. Coal 26 inches, and a dollar a ton is paid for mining. Coal consumed at Fulton and vicinity. Employment is given to 10 or 12 men.

Fulton Fire-brick and Mining Co.—L. V. Nichols, superintendent. Mine located 2 miles south of Fulton and connected with the Jefferson City branch of the C. & A. railroad. Shaft 100 feet deep, and steam-power used for hoisting. First inspection was made November 15, and the mine found in very fair condition. One of the hoisting-ropes was found unsafe, condemned, and the company instructed to replace it with a new one at once. A second inspection was made March 29, when again the mine was found in very fair condition, and a new rope put in place of the old one. Mine is ventilated by a furnace, which was giving very good results on both inspections. Coal about 3 feet thick and worked on the long-wall plan; \$1 per ton is paid for mining.

The mine is dry and in very fair condition; the roof is a soft soap-stone, requiring considerable timber to keep it secure. Thirty feet below the coal a fire-clay seam is worked; both the coal and the clay

are hoisted out through the same shaft. The clay seam is about 8 feet thick, and worked on the room and pillar plan, for which the company pay 26 cents per ton for mining. Most of the coal is used by the company in the manufacture of the clay into brick and other articles, thus giving employment to from 50 to 60 hands around the mine. The company has erected new buildings and put in new machinery for the manufacture of the clay into fire-brick, drain and sewer pipe, particulars of which will be found in table on improvements.

Harris Bros.—Mine located $\frac{1}{4}$ of a mile north of the Fulton Brick Co. and $1\frac{1}{2}$ south of Fulton. Shaft 80 feet deep; horse-power. This mine has shipping connection with the south branch of the C. & A. railroad. Ventilation is furnished by a furnace; coal 34 inches thick; worked on the room and pillar plan. The mine has been operated the past year on a small scale, the product being consumed in the surrounding country.

John Harris.—Mine located one mile southeast of Fulton; shaft 45 feet deep; horse-power; ventilation produced by a small furnace. Coal about 33 inches thick, worked on the long-wall plan. One dollar per ton is paid for mining screened coal. Employment is given to six or eight men in fall and winter. Coal hauled in wagons to Fulton, where it is consumed.

Rufus Bishop operates a mine in the vicinity of Fulton. Drift opening; coal 30 inches in thickness and worked on the long-wall plan. The coal is sold in the home market.

John Bishop operates a mine in the same locality, on the same seam, and the output of the mine goes to supply the same market.

James Smith.—Drift opening. Mine operated in fall and winter to supply local trade.

Simons & Flowers.—Drift opening. Mine operated in the winter season to supply local trade.

John Marsenkoff, mine located near Fulton. Drift opening; coal about 30 inches thick, and worked on the long-wall plan. A dollar a ton is paid for mining, and the product sold in the home market. There are other parties mining coal at various parts of the county to supply the winter trade.

A pocket of coal has been discovered at Ham's prairie, about 8 feet thick, of the cannel coal nature. It is overlaid by rock roof, and from all indications is an extensive pocket. Mr. I. A. Litel made the find, and is operating the mine.

CARROLL COUNTY.

Production, 920 tons.

This county is underlaid by the coal measure formation, and coal has been found in various parts of the county; but very little mining is carried on here; the coal varies in thickness from 18 to 24 inches, and is the same seam as that so extensively mined in Bay county; it is overlaid by a good roof and is easily secured with timber. There are several parties operating mines at Little Compton, and in the vicinity of Carrollton, to supply the home demand; the product of the mines, with other information, will be found in the statistical tables of this report.

CEDAR COUNTY.

Production, 730 tons.

Very little mining is done in this county; the coal is found in local deposits in the hills, and the mines are entered by drifts; it varies in thickness from 24 to 35 inches; it is of good quality and overlaid by very good roof; the mines are located in the vicinity of Jerico, and are operated to supply the home consumption. Names of parties operating these mines, and the product of the same, will be found in the statistical tables of this report.

CHARITON COUNTY.

Production, 185 tons.

While Chariton county is all underlaid by the coal measures, and the coal found at various parts of the county, yet very little coal has been mined.

John Huenten is operating a drift mine near Guthridge mill to supply home demand.

R. W. Isle operates a mine at Indian Grove to supply the home consumption.

The Salisbury Coal Company was formed during the spring of 1894; it sunk a prospect shaft and struck a 5-foot seam of coal at a depth of 185 feet; a larger shaft was sunk at once, about 175 feet from the trial shaft, and on September 1, a 4½-foot vein of coal was struck at a depth of 175 feet; head gear, top-house and a tippie have been erected, and a switch-track laid down; machinery and ropes, cages and pit-cars have been built, and the mine will soon be in operation; it is located on the southwest side of the city, within its corporate limits.

CLAY COUNTY.

Production, 19,371 tons.

KANSAS CITY POSTOFFICE.

North Kansas City Coal Co.—Oliver C. Hutchinson, manager. Mine located at Randolph, 6 miles northeast of Kansas City. Shaft 430 feet deep and operated by first-class machinery. A 12-foot ventilating fan is used to ventilate the mine, which was giving good results at dates of inspections. First inspection was made August 19, 1893, and the ventilation was found good; otherwise the mine was in poor condition, with very little improvement made since my former visit. The shaft bottom was in very bad shape and needed retimbering. There were about 40 men at work on this date. The company started to sink an escapement-shaft in January, 1893, and was down about 250 feet on date of this visit. December 11 I visited the mine again, and found the ventilation up to the requirements of the law, but the mine was in the same condition as on my last inspection, with about 50 men at work.

The sinking of the escape-shaft was progressing very slowly, as only 25 feet had been sunk since my last visit of August 19. I left the mine, as usual, full of good promises that the work would be pushed with more speed in the future. On the 7th of March I inspected the mine again and found the inside workings in very poor condition, with no improvement made during the year, as much as the mine needed it. I was greatly disappointed to find that the escapement-shaft had not gone down a foot since my last visit, and the following letter was sent to the company:

JEFFERSON CITY, Mo., March 8, 1894.

North Kansas City Coal Co., Kansas City, Mo.:

GENTLEMEN: In the month of June, 1893, you promised me your escapement-shaft would be finished during the month of September next following. Having visited your mine yesterday, I was surprised to find the escapement-shaft not yet completed. Your carelessness and neglect in this matter convince me that I have been too lenient, and now I am forced, by the condition in which I find your mine, to insist that you increase the force at work on escapement-shaft, and complete the same not later than April 15, 1894. I expect to visit your mine before the date fixed for completion of shaft, and hope to find the mine in better shape. If escapement-shaft is not completed on the 15th day of next month, I shall order the mine closed until the same is completed. Trust you will consider this final and act accordingly.

Very respectfully,

CHAS. EVANS,

State Mine Inspector.

To the above letter the company replied "that it would be impossible for them to complete the escape-shaft in the time limited, and that

they would close the mine then in order to do the necessary repairs, and to put the mine in good shape for the winter trade."

On the 11th of April I made another visit to the mine, and found that the same had been closed down as far as the mining of coal was concerned, and only a few men were at work taking the water out and retimbering the shaft bottom. About the first week in July, 1894, we were informed that the plant burned down during the night, but fortunately there was no one in the mine at the time. Since the above was written we visited the mine again, and found that the pumps and pit-cars had been taken out of the mine, and the same had been temporarily abandoned with the escapement-shaft uncompleted.

MISSOURI CITY POSTOFFICE.

In the summer of 1893 the citizens of Missouri City formed a coal company and sunk a shaft on the west end of the town, which will be connected with the Wabash railroad. I visited the place on the 12th of April and found the shaft down 145 feet, with 25 feet more to go to reach the coal. The shaft was making a large amount of water, which greatly retarded the progress of the work. As soon as coal is struck the mine will be equipped with machinery, and the shipment of coal will commence at once.

COOPER COUNTY.

Production, 2000 tons.

There is considerable coal in Cooper, and mining has been carried on in the county for a great number of years, but on a small scale. The coal lies in local deposits, and pockets are mostly of the cannel variety; it is found all over the county, although there is a small seam of bituminous coal worked in the vicinity of Boonville.

BOONVILLE POSTOFFICE.

H. W. Jenkins is operating a drift mine near Boonville; coal 18 inches thick, and worked on the long-wall plan; the coal is consumed in the neighborhood.

Chas. W. Hazell operates a drift mine near Boonville; coal 17 inches thick, and is worked on the room and pillar plan; the coal is consumed at home.

Missouri Valley Coal Co.—Mine located four miles west of Boonville; connected with the Boonville and Lexington branch of the Mo. Pac. R. R.; shaft 95 feet; steam-power is used for hoisting. This is a pocket of coal situated on the south side of the Missouri river, and been worked for a number of years; it is of the cannel variety,

and is mostly used to make gas; coal consumed in Kansas City and at local towns along the road.

The Stanley Coal Company, of Sedalia, operated a mine last year near Vermont station. A pocket of good cannel coal was discovered, and operations were at once commenced to work the same. The coal is about 6 feet thick, of very fine quality for gas purposes as well as for fuel.

DADE COUNTY.

Production, 2639 tons.

Mining has been carried on in Dade county for a great number of years, but only on a small scale to supply the demand of the surrounding neighborhood. The coal is found in the hills, and the mines are entered by drifts; it will average about 32 inches in thickness, and is of very good quality. The mines are located 12 miles from a railroad, and the coal is taken away in wagons and consumed at Greenfield, Golden City, Lockwood and the surrounding country. Following is a list of the names of parties operating mines in this county :

SYLVANIA POSTOFFICE.

R. M. Shook.—Mine located at Sylvania; slope opening; coal 24 inches thick, and worked on room and pillar plan; about 8 men employed.

Robert McCluey.—Mine located at Sylvania, slope opening; coal 30 inches thick and worked on the room and pillar plan, employing from 4 to 6 men.

McCombs' mine, located at Sylvania, drift opening; coal 30 inches thick and worked on the room and pillar plan, employing from 3 to 4 men in winter.

The McGarveys' mine is operated by Thomas Allen; slope opening; coal 30 inches thick and worked on the pillar and room plan; about 6 men employed.

W. E. Sutton is operating the Seaton mine, which is also located at Sylvania; coal 34 inches thick and worked on the pillar and room plan, employing from 3 to 4 men.

GRUNDY COUNTY.

Production, 35,000 tons.

Grundy county has maintained her old position during the past year as the twelfth coal-producing county of the State. Thirty-five thousand tons of coal were produced during the past year, which was sold for \$66,625. This, as compared with the preceding year, shows a slight decrease in tons, and 15 cents per ton in the price received for the output at the mines. Following is a description of the mines :

TRENTON POSTOFFICE.

There are only two mines in operation in this county at present — both of which are located at Trenton, and are owned and operated by the Grundy County Coal Company. Both mines have shipping connection with the C., R. I. & P. railroad, which road consumes the product of the mines, except that which is sold to supply the home market. The coal is 18 inches thick, and overlaid with a good slate roof, requiring very little timber to keep it secure; it is well adapted for the long-wall method of working, which system is followed; eighteen inches of the slate is taken down in the roadways of all the rooms, to make height to load. The price paid for mining varies in the two mines, as well as in summer and winter.

Mine No. 1 pays \$1 per ton in summer and \$1.12½ per ton in winter while mine No. 2 pays \$1.25 per ton in winter and \$1.12½ per ton in summer. The coal is dumped and run over a screen at mine No. 2 before it is weighed; this I consider in violation of section 7054 of the mining law of this State. Following is a description of each mine as found on dates of inspection:

Mine No. 1 has a shaft 210 feet deep, and is equipped with steam-power for hoisting. The mine has been in operation for about 18 years, and is very extensively worked. The curbing of the shaft is rotten, and needs to be retimbered; the engine-house and pit-top were burned down on the 6th of April, but have been rebuilt; this change has made considerable improvement, as the old buildings were very rickety. The engine has been repaired and reset on a more substantial foundation than before. New-hoisting ropes have been put on, and new cages have been built, all of which leaves the plant in better condition than it has been for years. Ventilation is supplied by a 10-foot fan, which was giving very fair results at date of inspection, considering the long distance, and the contracted air-ways the air has to travel in. The air is divided into two currents, and forced by the fan around the face of the workings, thence returning and escaping out through hoisting-shaft. Enough air was circulating through the mine to comply with the requirements of the law, and was well distributed to all workings. The roadway is dry, high and in very fair condition. The product of this mine is consumed by the railroad company, in coaling its engines at the mine. The coal is of a very good quality for steam, and all other fuel purposes.

I. Bingey, foreman.

Mine No. 2 has a shaft 170 feet deep, operated by first-class machinery. The engines were built by the Ottumwa Iron Works Company,

and are 14×28 inches in cylinder, connected direct to a 7-foot drum, with two boilers to supply the power. The mine is ventilated by a 10-foot fan, the same being set on top of the air chamber, which is partitioned off from one end of hoisting-shaft.

An inspection of the mine was made December 7, and deficiency in the ventilation was found in some parts of the mine, for the want of doors properly placed to conduct the air around the workings; but men were put to work at once, to remedy the evil.

Second inspection was made April 28, and the mine was found better ventilated than on former visits. The air is circulated around the workings in two currents—part going through the east, and part through the west side, meeting again on the east side, where it returns to the upcast; the mine is still making considerable water, coming from the roof as it does, causes the same to become friable and hard to keep up at such places. An underground traveling-way has been made during the past year, between mines 1 and 2, as an avenue of escape for the men in case of accident to either of the mines. The roadways are wet and low, and require considerable attention, making it a very costly mine at best, to keep in any kind of condition. There were 83 men at work at date of last visit, and the output of the mine had largely increased. The product is consumed by the Chicago, Rock Island & Pac. R. R. C. R. Aladize, foreman; N. Shaklin, manager.

GALT POSTOFFICE.

The Medicine Valley Coal Co. are sinking a shaft at Galt city, and the same was down about 50 feet at date of my visit in the latter part of April. Coal will likely be struck at the depth of about 135 feet, and the seam proved to be the same as that so extensively mined at Trenton. The shaft is being sunk by horse-power, but as soon as the coal is developed, steam-power will be employed, and the mine operated on the long-wall plan. Shipping connection will be made with the Q. O. & K. C. R. R.

R. A. Brough, superintendent and manager.

HENRY COUNTY.

Production, 84,473 tons.

This county has shown a regular decrease in product from 1889 to the present; for the latter year the output was 210,366 tons, then 127,281 tons, 144,139 tons, 137,258 tons, 125,962 tons, and this year 84,473 tons, showing a total decrease since 1889 of 125,903 tons. The principal mines are located at Calhoun, Deepwater and Lewis station. But there are other small mines in the vicinity of Clinton, Brownington and

The following is a description of the principal mines :

BROWNINGTON POSTOFFICE.

Blair Diamond Mine.—John Thompson, superintendent; mine located south of Brownington, and connected with the Bailey railroad by a switch; shaft 50 feet deep; steam-power used for hoisting; we made an inspection of this mine December 20, and found all the men drawing back pillars, and that the mine would soon be abandoned. In May, when inspecting mines in the same vicinity, we were informed that the mine had been abandoned, and the machinery moved to another mine.

D. O. Blanchard & Son.—Mine located four miles south of Brownington; shaft 40 feet deep; horse-power; ventilation is furnished by a fire basket, in the air-shaft, and was giving poor results at dates of inspections; canvas doors were also used in place of wooden ones, and the same were so poorly constructed that very little air was going round the workings. Instructions were given to this company to remedy the evil at once; coal 38 inches thick, and worked on the room and pillar plan; paying for mining about 85 cents per ton in winter, and 75 cents in summer. Coal is hauled in wagons and loaded on railroad cars at Eaton switch, and shipped over the K. O., Ft. S. & M. R. R., and consumed at local towns along the line of the road; but the most of the product of this mine, during the past year, was consumed at the tile and brick works at Deepwater.

Huey & Kerens.—Mine located 4 miles south of Brownington. Slope opening, from the bottom of a strip-pit; 4 men are employed, and the coal is hauled in wagons and loaded on cars at Eaton switch, and shipped over the K. O., Ft. S. & M. R. R.

Dunlap operates a slope opened out from the bottom of a strip-pit near Brownington; about 3 men are employed, and the product is consumed in the immediate vicinity.

Henry Stevens operates a mine between Deepwater and Brownington, on the old Hobbs place. Slope opening, and ventilation is produced by a small furnace; coal 3 feet thick, and worked on the room and pillar plan; about 12 men employed. Nearly all the product of this mine is consumed by the brick works company at Brownington.

Michaels & Sheardon.—Mine located 1 mile west of Brownington. Shaft 40 feet deep; horse-power used for hoisting, and ventilated by a furnace. This mine was opened last fall, and about 20 men were employed through the fall and winter. Coal 38 inches thick, and worked on the room and pillar plan, paying 85 cents per ton in winter and 75 cents in summer. The coal is shipped over the Bailey road and con-

d at local towns along the line.

Kansas City Coal and Fuel Company, Wm. Simpson superintendent.—Mine located two miles south of Brownington, connected by a switch with the Bailey road; shaft 85 feet deep; steam power used for hoisting. This mine was opened in the fall of 1893 by a party from Colorado, and is known in this vicinity as the Colorado mine. The coal proved to be faulty and irregular, and the Colorado party quit operating the mine sometime in March, 1894. May 8th, while on my second tour of inspection in Henry county, I found Hurst, McFadden & Co. had taken charge and was operating the mine; the ventilation was found deficient: in fact there was no air in the mine nor any system of ventilation adopted; the company had an escapement-shaft going down at date of my visit, and the work at the mine was stopped until the same was completed. The machinery had been used at other mines and moved here, as had also the pit-head, which was poorly constructed. The hoisting-ropes were found unsafe and condemned, and the company instructed to put in new ropes at once. Coal 3 feet thick and worked on the room and pillar plan; the roof is soft and friable; the product of the mine is consumed by the railroad company.

Thompson Bros.—Mine located 1 mile west of Brownington; shaft 50 feet deep, and the product hoisted at present by horse-power; but the company will soon put in machinery. This is a new mine, opened in the fall of 1893. The ventilation is produced by a furnace. Coal 38 inches thick and worked on the room and pillar method. Mining is paid for at the rate of 85 cents per ton in winter, and 75 cents in summer. The roof is a hard shale which stands well in all parts of the mine. About 25 men employed, and the coal is hauled over the K. C., O. & S. railroad, and consumed at local towns along the line.

George Thompson operates a mine near Brownington, to supply the home demand.

James York and Alex Wagoner are operating a strip-pit 4 miles south of Brownington, and the product is shipped to market over the K. C., Ft. S. & M. railroad.

CALHOUN POSTOFFICE.

Calhoun Coal company.—Mine located two miles southwest of Calhoun and connected with the M., K. & T. railroad. Shaft 35 feet deep: steam-power. Ventilation is produced by an 8-foot fan, and the mine fairly ventilated. Coal 30 inches thick and worked on the long-wall plan, using the movable face track. Price of mining 70 cents per ton. The product is consumed mostly by the railroad company.

CLINTON POSTOFFICE.

There are no mines in the immediate vicinity of Clinton, but several mines are located on the east and southeast, and the coal from these mines is hauled in wagons to supply the demand of the Clinton market.

McBeth & Shorter operate a mine 4 miles southeast of Clinton. Shaft 40 feet deep; horse-power; coal from 24 to 26 inches in thickness, and worked on the room and pillar plan. Mine is only operated in fall and winter, to supply the home market. From 6 to 8 men are employed.

Leon Owens.—Mine located 3 miles east of Clinton. Slope opening, operating in fall and winter, and employing 4 men to supply the local trade.

Andrew McCloud is operating the mine formerly operated by J. Robinson. Shaft 20 feet deep, and hoisting by a horse. Thickness of the coal, and mode of working, and price paid for mining, the same as that of other mines in this locality. Coal consumed in the vicinity.

Hay & Wollworth sunk a shaft on the Kurks farm, and struck 26 inches of coal at a depth of 38 feet. Machinery was put up to hoist the product, and a side track graded to connect the mine with the Bailey road, but for some cause the mine has been abandoned; as on second visit to the mine on the 9th of May, the place was deserted and the shaft full of water.

Henderson & Allison operate a strip-pit and a shaft $3\frac{1}{2}$ miles southeast of Clinton, hauling the coal in wagons and selling it to the home market.

Herring & Hess.—Mine located south of Clinton and east of North station. The mine is near the banks of Grand river. It is a slope opening. The coal is hauled in wagons and loaded on cars at North switch. Three men employed. Mine only running during the winter months.

Wm. England operates a mine about 4 miles southeast of Clinton, near the banks of Grand river. Coal about 3 feet thick, worked on room and pillar plan. The coal is consumed in the neighborhood.

Stockton Bros. have opened a mine on the Avery farm, 4 miles south of Clinton. Shaft 45 feet deep; horse-power; coal 26 inches thick and worked on the room and pillar plan. The coal is hauled in wagons to Clinton, where it is consumed.

John Daniels operates a strip-pit on the Carlyle farm to supply the home market.

DEEPWATER POSTOFFICE.

Brann Coal Company.—Ed. Brann, foreman. Mine located 4 miles south of Deepwater; shaft 50 feet deep; horse-power. Coal 3 feet thick; worked on the room and pillar plan. About 4 men employed. The coal is hauled from the mine in wagons, and loaded on cars at Eaton switch, and shipped over the K. C., Ft. S. & M. railroad, and consumed at local towns along the line.

Joe Hurst operates a mine 4 miles south of Deepwater. Slope opening. Coal 3 feet thick, and worked on the room and pillar method; from 6 to 8 men employed in fall and winter. The product is shipped over the K. C., Ft. S. & M. railroad.

Will. Hurst operates a mine in the same vicinity. Drift opening, from the bottom of strip-pit.

John Hurst is operating a mine 4 miles south of Deepwater. Shaft 35 feet deep; horse-power. Coal 3 feet thick, and worked on the room and pillar plan, and paying a dollar per ton in winter and 80 cents per ton in summer for mining. The coal from this mine is hauled in wagons and loaded on cars on Eaton switch, and shipped over the K. C., Ft. S. & M. railroad to points north and south.

John McCardell operates a strip-pit 3 miles south of Deepwater to supply the home trade.

Wm. Thompson operated a mine in the vicinity of Deepwater, but sold out to John Hurst, who operates it at present. Slope opening; thickness of coal, mode of working, and price paid for mining are the same as that of other mines in this locality.

McFadden & Son operate a mine 4 miles south of Deepwater. Slope opening; coal 3 feet thick, and worked on the room and pillar plan. This mine, like all the other mines in this vicinity, is ventilated by a small furnace. The product is hauled in wagons and loaded on cars at Eaton switch and shipped over the K. C., Ft. S. & M. R. R., and consumed at towns along the line.

Rees & Son operate a drift mine in the same locality as the last-named mine, working the same seam, and loading on same switch, and shipping over the same railroad. There are several other parties in this same neighborhood operating mines on a small scale, which I had no time to visit.

Central Coal and Coke Co., John Perry, general manager, Robert Barr, superintendent.

The mine is located one mile northeast of Deepwater, and connected with the K. C. Ft. S. & M. R. R.; shaft 60 feet deep; equipped with good machinery; ropes, gates, cages and safety-catches are kept

in good repair; ventilation is furnished by a 14-foot fan, making 80 revolutions per minute, and passing 18,300 cubic feet of air around the workings in the same time; the air travels from the down-cast to face of south entry, where it divides, part going to the east and part to the west side, making its return to the fan through the face of the workings, giving equal proportion of the current to each man in the mine; considerable heat is discovered at parts of this mine from the slow combustion that steadily exists in the refuse of the mine stored away in the gobs; but as the air-current is strong enough to sweep it away, the miners do not have it to contend with. Coal from $2\frac{1}{2}$ to $3\frac{1}{2}$ feet in thickness, and worked on the long-wall plan; mining is paid for at the rate of 85 cents per ton in winter, and 75 cents in summer; roadway high and dry and in good condition. While this mine has been in operation longer than any other mine in the county, and worked more extensively than any other three mines, yet it is in better condition now than any of the new mines. It gives employment to 75 men. The coal is shipped over the K. C. Ft. S. & M. R. R. to points north and south along the line.

Joe Hurst has opened a new mine half a mile south of Deepwater. Shaft 25 feet deep; horse-power; coal consumed at Deepwater.

LEWIS STATION POSTOFFICE.

Co-operative Coal company, J. M. Johnson, superintendent.—Mine located $\frac{1}{2}$ mile west of Lewis and connected by a switch with the M., K. & T. railroad. Shaft 70 feet deep; steam-power; ventilation furnished by a 10-foot fan, and the mine is well ventilated. Coal 30 inches thick, and worked on the long-wall plan, using the movable face track. The pay for mining is 70 cents per ton. Mine dry and in very fair condition. About 25 men employed, and the coal shipped over the M., K. & T. railroad to Sedalia, where it is consumed.

D. B. Pigg Coal company.—Mine located $1\frac{1}{2}$ miles northeast of Lewis station. Drift opening, and the mine is ventilated by a small furnace. Coal 30 inches thick, worked on the long-wall plan, using the movable face track, and paying 70 cents per ton for mining. Employment is given to 15 or 20 men. Coal is hauled from the mine over a tram road for $\frac{1}{4}$ of a mile and loaded on cars and shipped over the M., K. & T. railroad to Sedalia.

Tebo Coal Co.—John Bowen, superintendent. Mine located 2 miles northeast of Lewis station and connected with the M., K. & T. railroad. Shaft 60 feet deep, and operated by steam-power. Mine ventilated by a furnace, which was giving good results at dates of inspections. Coal 30 inches thick, worked on the long-wall plan, using the movable face track, and paying 70 cents per ton for mining screen coal.

The roof which overlays the coal seam in the surroundings of the Calhoun and Lewis station mines, is a good, hard slate, very suitable for the long-wall method of mining, which is used at all the mines. The product of this mine is consumed by the railroad company. Chutes have been erected at the mine to coal engines.

NORTH POSTOFFICE.

North Clinton Coal Co.—W. A. Bridges, manager. Mine located at North station and connected by a switch with the K. C., Ft. S. & M. railroad. Shaft 50 feet deep, using steam-power for hoisting. This mine remained idle during the summer and fall, up to November, 1893, when Mr. Bridges took charge. I inspected the same December 22, and found it in a very bad condition. The air-courses were nearly closed, and no air in the mine, and the roadways wet and muddy. Instructions were given to the officers of the company to clean and enlarge the airways and get more air through the mine.

May 3, I made another inspection, and very little improvement had been made in the ventilation since my former visit. I was informed that the mine would soon change hands again. Coal 3 feet thick, worked on the pillar and room plan. The coal is mined by blasting off the solid.

I have been informed that another company has purchased the mine, and that another shaft will be sunk, the machinery moved to it, and the present shaft be used as an escape-shaft.

WINDSOR POSTOFFICE.

B. Beaman operates a mine 6 miles north of Windsor. Shaft 35 feet deep; horse-power. Coal 5 feet thick, worked on the room and pillar plan. From 6 to 10 men employed. The coal is consumed at Windsor and the surrounding country.

W. E. Hughes operates a mine 2 miles south of Windsor. Shaft 25 feet deep; horse-power. Coal 5 feet thick. Employment is given to 6 or 8 men to supply the home market.

Wm. Shook operates a mine 6 miles north of Windsor. Coal from 5 to 6 feet thick, and brought out through a shaft, the hoisting being done by a horse-power. The coal is consumed in the surrounding country, but some is hauled in wagons and loaded on cars at Windsor and shipped.

JACKSON COUNTY.

Production, 6729 tons.

KANSAS CITY POSTOFFICE.

Kansas City Clay & Coal Co., E. A. Phillips, receiver; James Russell, superintendent.—This mine is located about 2 miles southeast of the city limits of Kansas City, and is the only mine in Jackson county. The shaft is sunk to the lower vein, which is 400 feet below the surface, but the seam that is worked is 80 feet above, or 320 feet to the landing. The mine is equipped with good machinery, and money has been lavishly employed in order to make it a first-class mine. A 10-foot ventilating fan is used to ventilate the mine, and the same is set at east end of hoisting shaft, exhausting through an air-chamber partitioned off one end of main shaft. The fan is connected by a belt, and is very poorly constructed. In fact, it was condemned on my first visit to the mine in 1893, but was informed that the present fan was put up temporarily, and that a larger one would be used as soon as the air-shaft was sunk. I am very much opposed to connecting and running fans by the aid of belts, as they are unreliable and subject to contraction and expansion with changes of temperature, and to frequent breakage. The constructors of fans have remedied the above evils by connecting the engine direct to the fan-shaft, which can be easily regulated in speed according to the requirements of the mine.

This is a very gaseous mine, and several explosions of gas have occurred here during the past year, which will be fully explained in this report, together with the personal attention given it by this department. The gas comes down from the roof, and as the mine is worked on the long-wall plan, a new supply is given off with every fresh break in the slate, and which, if the fan works properly, is quickly carried away and diffused at the face of the workings by the air-current constantly traveling in that direction. The seam being low, a large amount of the roof had to be taken down on roadways in all the entries to give height, and as the air current was being conducted around the face of the workings, the gas would accumulate in the brushing in large quantities, as not enough air was caused to travel over the entries to take away the gas as it was generated from the roof, the result was dangerous quantities accumulated there. Realizing the situation at this mine, the company was notified by this department on the 1st day of May, 1893, to sink an escapement-shaft at once, as required by section 7063 (R. S.) of the mining laws of Missouri, and the same to be completed within six months from date of notice. On the 27th day of the year, the following letter was received:

KANSAS CITY CLAY AND COAL CO., }
KANSAS CITY, MO., July 26, 1893. }

CHAS. EVANS, State Mine Inspector, Jefferson City, Mo.:

DEAR SIR—Some time since we received a communication from your office instructing us to put down an escapement-shaft, and to have same completed by November 1, 1893.

This company has spent a great deal of money in opening up our mine, and is, with the great stringency in the money market, has caused us to be hard up. Our ready funds were tied up in one of the suspended banks here, and at the present time we have no capital with which to do the work that you desire to have done. It is also impossible to borrow money for the purpose mentioned. We are running along now, getting in just about money enough to meet our pay-rolls, and with the great cost of production attached to the opening up of a new mine, and especially where the product is sold at summer prices, you will readily perceive that there is a positive loss in operating now. We are willing to stand a little loss on our productions in order to open up our mine.

If we are compelled to go on with the sinking of the air-shaft we will be compelled to shut down now, and throw from 60 to 70 men out of employment.

If we can be permitted to run along as we are now, we will agree to begin to work on air-shaft not later than May 1, 1894, and will prosecute the work diligently until the shaft is completed. We trust that you can see your way clear to grant this request.

Yours truly,

KANSAS CLAY & COAL CO.

By J. M. PERRY, Secretary.

To the above, this department answered as follows:

JEFFERSON CITY, August 2, 1893.

To the Kansas City Clay and Coal Company, Kansas City Mo.:

GENTLEMEN—I am in receipt of your favor of the 26th ult. Because of the imminent danger to human life involved in the operation of your mine under existing condition, I deem it important that means of escape should be provided at the earliest practicable day. I appreciate the force of what you say, and the difficulty likely to be encountered in sinking the escape-shaft at this time; and while not disposed to be too exacting in matters of this kind, I do not feel at liberty to say that I consent and agree to such postponement as proposed by you in beginning, and prosecuting the work to be done to furnish an avenue of escape to the miners in the event of accident. I do not feel that I could safely authorize such postponement. If the work is delayed, I could not well consent to have it said that it is done with my approval. And whatever postponement is had, if any, must be undertaken on the sole responsibility of those concerned in the mine, both as operators and miners.

Respectfully,

CHAS. EVANS, State Mine Inspector.

I made the first visit to the mine during the past fiscal year in September, 1893, and learned that the company had failed, and found the mine idle. December 9, of the same year I visited the mine again, and was informed that the same was in the hands of a receiver, who started to operate it in November. A careful inspection was made at this date of all the workings. The fan was making 72 revolutions per minute, and was removing 12,344 cubic feet of air around the workings in the same time. This volume of air was coming down the hoisting-shaft, and was

conducted to the face of the first northwest entry, where it was split into two currents, one going north and the other current traveling south, along the face of the workings, until it united again at the first northeast entry, at which point it returned to the upcast. The face of the workings was well ventilated at date of this inspection; in fact, double the amount of air required by law was found passing, but gas was found in small quantities in the brushing, in all the entries. The attention of the superintendent, Mr. Jas. Blair, was called to that fact, and he was instructed to provide air enough to travel over all the entries, to keep them clear of standing gas. The mine having changed management, and nothing having been done toward the commencement of sinking an escapement-shaft it became the duty of this department to notify the present managers of the requirements of the law, and the following letter was sent:

JEFFERSON CITY, Mo., January 2, 1894.

E. A. PHILLIPS, Esq., Receiver of the Kansas City Clay and Coal Co., Kansas City:

DEAR SIR—The change in the management of the Kansas City Clay and Coal Co. makes it necessary that the instructions given to its former managers in connection with the sinking of an escapement-shaft be repeated. The situation at the mine of which you are receiver, demands of me more than ordinary care and attention. The depth of shaft, the amount of gas in the mine, the number of men employed, with but one way of escape, taken together, with the location of the top-buildings, presenting as they do in case of fire such fearful possibilities of cutting off all escape, is a risk I cannot take. I am, therefore, with a due appreciation of the stringency in money matters, and with the best wishes for the general good of the mine, and the welfare and prosperity of its operators, compelled to insist on the immediate commencement and prosecution of the same with the utmost speed in the sinking of an escapement-shaft at the mine of the Kansas City Clay and Coal Co., and for which you are the receiver. I have no discretion in the matter; the law is plain, and the instructions herein are given in obedience to the same. I trust you will at once comply, and thus avoid compelling me, much against and in opposition to my wishes, to resort to extreme measures. Respectfully,

CHAS. EVANS, State Mine Inspector.

January 23d I visited the mine again and found it idle; the miners were striking against a reduction in the price of mining. I also found that nothing had been done toward commencing the sinking of the escape. February 1st the following letter was sent from this department:

JEFFERSON CITY, Mo., Feb. 1, 1894.

Kansas City Clay and Coal Co., Kansas City, Mo.:

GENTLEMEN—Ever since last May your company has been urged to sink an escapement-shaft. On the 2d of January, 1894, the receiver of your company was informed of my position in the premises, and urged to commence work on escapement at once; work has not only been delayed, but so has reply to my communication. I now expect to find work commenced at your mine on sinking escapement shaft within the 10 days next succeeding this date, or I will visit your mine and order it closed. Respectfully,

CHAS. EVANS, State Mine Inspector

February 2d a reply to the above was received, stating, among other things, that the delay in commencing to sink the escape-shaft was caused; 1, by the absence of the receiver from Kansas City; 2, the trouble from the miners' striking; 3, waiting on Mr. Thos. Fleming to come to make a survey and locate the shaft; and 4, on account of the stringency in money matters, and still asking for further delay in the commencement of the work. To this letter this department replied as follows:

JEFFERSON CITY, Mo., Feb. 8, 1894.

E. A. PHILLIPS, Esq., Receiver of Kansas City Clay and Coal Co., Kansas City, Mo.:

DEAR SIR—Yours of the 2d inst. received and its contents fully considered. I realize your position thoroughly, and do not hesitate to state that I would feel a personal pleasure in extending your time for the commencement of work on escape-shaft. But when I take into consideration the depth of your shaft, the amount of carburetted hydrogen gas it generates, the number of wooden buildings in such close proximity to the shaft, in connection with the possibility that an explosion or fire would cut off the only avenue of escape, renders the risk too great for me to assume. In addition to this, I have no right, in accordance with the law, and my own judgment of the demands of the situation, to grant any further extension of time. Personal considerations shall have to be eliminated when the same comes in conflict with the law, by which my actions have to be governed. I cannot extend your time, for in so doing I would violate section 7072 R. S. of the mining law, as well as the oath I took in assuming the duties of mine inspector. Should I accede to your request and an accident occur in the interim, I would be held equally responsible with your company, and would forfeit my position in addition; for it would not be difficult to prove me guilty of neglect, and that, too, with my eyes open to the gravity of the situation. You should not forget that my duty is a sworn one to the State, governed by certain fixed and inexorable laws, over which my personal likes or dislikes cut no figure. It is but justice to myself that you should consider what I have at stake, and weigh it alongside of the conditions which influence your request.

My duties have been constantly, and are now, day after day, connected with mines and mining, to an extent that should cause me to be quite familiar with the proper condition of a mine; and having inspected your mine Dec. 9 last, and finding its requirements so manifest in the direction indicated, I do not feel that I need the outside influence or assistance suggested.

Yours, very respectfully,

CHAS. EVANS, State Mine Inspector.

Work was commenced on the escape-shaft about February 10 in compliance with my instructions, and about 20 feet sunk, when the work was suspended to erect machinery to hoist.

On the 2d of March an explosion of gas occurred at this mine, about 2 o'clock in the afternoon, which caused the death of two men and the injuring of four others, with some damage to the mine. Not being duly notified of the accident, I did not reach the scene of the accident until the 5th, and assisted the coroner at the inquest. The evidence obtained at the inquest and the verdict of the jury will be found in this report under the head of accidents.

March 6 I examined the mine and found the fan making 66 revolutions per minute, and removing 10,085 cubic feet of air in the same time; but the distribution was found to be unequal, as tests showed that only 2520 feet of this amount was circulating around the south side, while the north side was getting 7565 cubic feet, or three-fourths of the whole volume. On further examination through the mine, gas was found in large quantities in all the entries.

First test for gas was made on straight south entry, about 300 feet from shaft bottom, where gas was found 18 inches from the roof (or 18 inches thick); second test was made about 30 feet further south, with the same results; third test was made still further south, at end of brushing, with the same amount of gas still showing. This is the entry and the place where the gas ignited, and where the unfortunates lost their lives. Enough gas was found here on date of this inspection, if ignited, to blow all in the mine into eternity.

I then traveled through the face of the workings and made the fourth test on the southeast, where more gas was found; in traveling in this direction we came to a fall, which prevented our progress further in that direction, and we turned back and went to the north side of the shaft. Two tests for gas were made on the north entry, and from 15 to 20 inches of gas was found all along the entry for a distance of 50 feet, and on further investigation in the east and west entries a large amount of gas was found. The mine was in a much worse condition than at date of my inspection of December 9th. The airways on the southeast side was very small, and only a span of 12 square feet in area was left for the air to travel through. The entries were not properly ventilated, as not enough air was allowed to travel over them, and the gas was blocked in between doors and curtains.

Twenty witnesses were examined at the inquest (Mr. Blair being one of them), and all testified that it was a known fact to every one that worked in the mine that gas in large quantities existed in the south entry, and that no effort had been made to remove it; the only precaution apparently used by the superintendent to secure the safety of the miners was to order every one to keep their lights low. It was also proved at the inquest that the fan was stopped twice for repairs in the forenoon on the day that the explosion took place, and as a consequence the air current would be weaker, and a large amount of gas would accumulate; under the circumstances, the men should have been called out of the mine.

The superintendent, who had the care and safety of 69 of his fellow-miners under his charge, was ignorant of the dangerous condition mine at this date, as in answer to one of my question when Mr.

Blair was on the stand he (Blair) said that he had not been down in the mine that day, and all he knew was the information he received from others.

The gas ignited from the lamp of Thos. Duggins, on the south entry about 80 feet back from the face of the workings; he was badly burned and dead when found. Eugene Parker was found about 20 feet further out; he was alive when found, but died a few minutes after. The flame and force of the explosion traveled toward the face of the work, where four more miners were badly burned, but with one exception, all recovered.

The gas in this mine which comes from the roof is saturated with petroleum, and is the heaviest and the most wicked gas that I ever encountered in a mine.

After the explosion, the company sent for Mr. James Russell, of Huntington, Ark., to come and take charge of the mine. On the 7th the company were instructed by the department as follows:

All the airways at the Brush Creek mine must be cleaned and enlarged, and the air must be divided into 4 or more splits, with the main currents traveling over north and south entries to face of work, and then to split to east and west, thus doing away with all doors and curtains on these entries. An overcast must be erected to carry the air from one side to the other. Doors on east and west entries must be set at end of brushing, so as the whole volume of air will bear on the outside, and enough air be passed over top of each door to keep all the entries clear of gas. The mine must be clear of gas and perfectly safe before any one is allowed to enter it or to operate the same.

On the 13th of March I made another inspection of the mine, and found that an overcast had been erected and new doors set, and all the necessary changes made to split the air-current, as directed on my former visit. The north entry was found clear of gas, as were the east and west entries on same side of shaft. A good current of air was found traveling through, and this section of the mine was perfectly safe to work with naked light; but some gas was found on the south entry, owing to obstructions on the airways caused by falls of slate, but men were working night and day cleaning the falls and getting the air in circulation. On the 15th of March the following letter was sent to the company:

JEFFERSON CITY, Mo., March 15, 1894.

E. A. PHILLIPS, Esq., Receiver Kansas City C. and O. Co.,

Kansas City, Mo.:

DEAR SIR—Having on the 13th inst. made a careful and thorough examination of the mine near Brush creek, of which you are the receiver, I am pleased to inform you that I found it in much better condition than at the time of inspection, March 6. The east and west entries were found to be clear of gas, with a good current of air circulating through them and around the workings of that section of the mine, and the same to be in good safe working condition. The erection of the air cross-

ing, since my last visit, has added largely to the volume of air passing in the above-mentioned part of the mine.

The east and west entries on the south side were not found in so good a condition. These entries were not properly cleaned at my last visit, and some gas was found on the south entry; but I found men at work, and which work was continued night and day, removing obstructions so as to permit the free passage of air, and making other improvements for the better circulation of air around the workings, and through the southeast and southwest entries, as will, I am convinced, render harmless all gas lodging in these entries. When the south is placed in as safe a condition as the north side was on my last inspection, I can see no reason or objection to permitting your men go to work, and your mine being operated. The fan must be kept running night and day, and during the day should maintain a speed of 70 revolutions per minute. Should anything occur to prevent the running of the fan, the men must at once be called out of the mine. A practical and competent gas man must be required to visit each and every part of the mine every morning before allowing the workmen to go down the mine, and the mine must be found clear of gas and entirely safe. Would suggest that a careful man be employed whose duty it shall be to make a careful inspection of the mine each hour of the day, seeing that all doors and curtains are kept closed and in repair, with a close watch on gas. I also insist that the escapement-shaft be pushed night and day until completed. If the above requirements are strictly complied with, you have my permission to again operate the mine, under the management of Mr. James Russell, who I regard as a careful and competent man.

Yours respectfully,

CHAS. EVANS,

State Mine Inspector.

March 17 a letter was received from Mr. Russell, the superintendent, stating that the falls in the airways were cleaned, and a good current of air traveling, and that the mine was clear of gas. On the 29th of the same month another letter was received at this office from Mr. Russell, which read as follows:

KANSAS CITY, Mo., March 29, 1894.

CHAS. EVANS, Esq., State Mine Inspector, Jefferson City, Mo.:

DEAR SIR: I have cleaned all the falls, and the air is traveling nicely through all the splits and keeping the gas out of all the roadways on the entries. We don't find any gas in the mornings on the entries, nor in any other part of the mine, and everything here is in good shape. I took measurement of the air yesterday and found 13,350 cubic feet passing per minute, and the fan was making 70 revolutions in the same time. The men feel perfectly safe and are contented. I have cleaned the airways on the east side up to the air-shaft, and I will keep a close watch on the air and will see that the mine be kept clear of gas.

Very respectfully,

JAMES RUSSELL, Superintendent.

On the 9th of April, while inspecting mines at Lexington, a letter from Mr. Russell was received stating that another explosion had occurred at the Brush Creek mine, and that 7 men were more or less burned. I reached the mine on the 11th and made another investigation, and found it in a very safe condition. The fan was making 76

revolutions per minute, and was removing 16,465 cubic feet of air in same time, which is the largest volume found passing through this mine. It was divided into five splits, and each split was ventilating a separate part of the mine, and enough air was traveling over each entry to keep them clear of gas. The fan had been repaired and was doing more effective work and the mine was safer and in better condition than on any other inspection. There were about 65 men at work and every one was supplied with plenty of fresh air, and not an inch of gas could be found in any part of the mine. As the practice of removing the roof to give the required height to work in resulted in giving vent to much gas, and in addition to which, many cavities and irregular places in the roof afforded just so many places for the harbor of gas, I suggested that instead of taking down roof to secure the necessary room to work in, that the bottom be taken up. This suggestion was adopted and with gratifying results, as the air-current is permitted to travel along the entries unobstructed by the former uneven roof, or to contend with holes filled with gas, sweeping the gas away as it collects along the roof.

I made a thorough inquiry as to the cause of the explosion of April 4th, and learned that same occurred through the ignorance and carelessness of Mr. Hugh Blair, the gasman, who went to change a curtain at the face of the workings, which was used to carry the air up where there was a high break in the roof, and which was making a large amount of gas. By the use of this curtain the gas was taken away by the air current and rendered harmless before an explosive quantity could accumulate. While Mr. Blair was changing the curtains, the circulation of the air was cut off from these high breaks and consequently gas accumulated. After the curtains were replaced and the air caused to circulate through the breaks, and before the same had time to clear away the gas, Mr. Blair went to the place with his naked light and ignited the gas. The following-named persons were slightly burnt, who were working in the immediate vicinity of the explosion: W. Wess, Jas. Grant, Hugh Blair, Jas. Stockman, Hugh Sloan, Chas. Condon and James Robertson.

Another visit was made to this mine on the 12th of May, and it was found in good condition, but was much disappointed in finding that no work had been done at the escape-shaft since my previous visit, and the following letter was sent to the company at once:

JEFFERSON CITY, Mo., May 15, 1894.

MR. E. A. PHILLIPS, Receiver, Kansas City C. and C. Co., Kansas City, Mo.

DEAR SIR—I have just made another visit to the Brush creek mine (of which you are the receiver); I was much surprised and disappointed to find that no work had been performed in the escape-shaft since my last visit; in fact, no work

been done in the shaft since the latter part of February. When I notified you last January that work must be commenced on the escapement-shaft at once, I intended, and so instructed you, that it should not only be commenced, but the work continued until the same was completed. You apparently do not view my instructions in that way, as only a few days' work was done at that time, and for three months not a shovel-full of dirt has been taken out. I have already exceeded the bounds of my official duty, in permitting the mine to be operated in violation of law; and you have taken advantage of my leniency and disposition to aid you in considering the suspension of work at the mine. You are fully aware of the amount of gas generated in the mine, and the possibility of an accident must be, from experience, fully established in your mind, and still you persist in delaying the work of sinking an escape-shaft. You are hereby instructed to start the work of sinking an escapement-shaft within the next five days, and push the work with all possible speed, night and day, without stop, until the same is completed.

Failure to comply with the above will force me to close the mine until the escape shaft is completed.

I will notify the miners today that the mine is running in violation of law, and if they continue work they do so at their own risk and peril, and that I must be held blameless for any accident which may occur.

Very respectfully,

CHAS. EVANS, State Mine Inspector.

The following notice was posted at the mine as a warning to the miners:

NOTICE.

To the miners of the Kansas City Clay and Coal Co.:

Inasmuch as the Kansas City Clay and Coal Co. has failed to comply with the mining laws of this State in the matter of sinking an escapement-shaft, as required by section 7063 R. S. I hereby condemn the mine of the above-named company, known as the Brush Creek mine, as operating in violation and in opposition to the laws of the State, I take this method of warning all men working in said mine, that if they continue work they must do so at their own risk, for henceforth I shall hold myself blameless for any accident that may happen. Since May, 1893, this Department has endeavored to get this company to sink an escape-shaft without success.

Very respectfully,

CHAS. EVANS, State Mine Inspector.

On the 9th of June I visited the mine again, and found the same idle owing to the national strike of the miners, but work was progressing very fast on the escape-shaft; the same was down 96 feet at this date, and the work was being pushed night and day with all possible speed, and it was expected to be completed by the first day of September, 1894. Thickness of the coal at this mine will average about 20 inches, and is worked on the long-wall plan, using the movable face track, which is a great advantage to the miner in the handling of coal. This coal being of such good quality finds a ready market at home and demands a good price besides. As soon as the escapement-shaft is down and the mine opened more extensively, I feel no hesitation in saying that this will make a good paying mine under the present man-

agement. Price paid for mining, \$1.12½ cts. per ton for clean coal. About 60 men employed. On the 4th of September, 1894, we received a letter from Mr. James Russell, superintendent, stating that the escapement-shaft was completed, and that a large fan would be set at once in place of the old one. It is with satisfaction that I note the completion of the escapement shaft at this mine. It is due the management that it be commended for the energy displayed in the rapid and successful sinking of the shaft.

JOHNSON COUNTY.

Production, 15,427 tons.

The coal-measure formation underlies nearly all of Johnson county, and several seams of coal have been discovered and are worked in various parts of the county, but only in a small way. For the year ending June 30, 1894, the total product of the mines amounts to 15,427 tons, as against 12,101 tons for the preceding year, thus showing an increase of 3,326 tons. This product was sold for \$22,445, or an average of \$1.46 per ton, at the mines. Ten mines are reported as being operated during the year, and giving employment to 72 men. Description of the mines are as follows:

KNOB NOSTER POSTOFFICE.

Thos Boyd & Son.—Mine located one mile west of Knob Noster; connected with the Missouri Pacific railroad by a switch; shaft 67 feet deep, using steam-power for hoisting; ventilation is furnished by a furnace, which was giving very fair results on dates of inspection; coal will average about 3 feet 10 inches in thickness, and is worked on the room and pillar plan, paying for mining 62½ cents per ton, and giving work to about 15 men. The product is consumed by the Missouri Pacific Railroad Company.

MONTSERRAT POSTOFFICE.

P. D. Fitch.—Mine located at Bristle ridge. Drift opening. Coal two feet six inches thick and worked on the room and pillar plan. From six to eight men employed in winter. Coal hauled in wagons and loaded on cars at Montserrat, and shipped over the Mo. P. railroad, and is consumed at local towns along the line.

Joseph Murley.—Mine located at Bristle ridge. Drift opening. The coal will average about 1½ feet in thickness and is worked on the pillar and room plan. From six to eight men employed. The coal in the vicinity of Bristle ridge is of very fine quality and finds a ready market wherever it is once used; but, being so far from a railroad

cost of hauling it in wagons five miles makes it sell very high and is a drawback to the output. The product of this mine is all consumed at Sedalia.

WARRENSBURG POSTOFFICE.

L. M. Herrington.—Mine located three miles south of Warrensburg. Drift opening. Coal two feet thick, worked on the room and pillar plan. Mine only operated in winter to supply local trade. Coal consumed at Warrensburg.

M. B. Meiley operates two mines, one a slope and the other a shaft, three miles south of Warrensburg; the shaft is 25 feet deep; horsepower; ventilation produced by a stove; coal about two feet thick; worked on the room and pillar plan; coal hauled in wagons, and consumed at Warrensburg and surrounding country.

Madison Murray operates a slope mine $1\frac{1}{2}$ miles north of Warrensburg to supply home trade.

W. L. Ronemous operates a slope mine at Bristol ridge, and the coal hauled in wagons to Warrensburg, where it is consumed; coal of same thickness and worked on same method as other mines in that locality.

G. H. Sack operates a drift mine four miles south of Montserrat; coal two feet eight inches thick; worked on the room and pillar plan; the product hauled and consumed at Warrensburg.

W. R. Staley.—Drift opening; mine located north of Warrensburg; operated only in winter to supply home trade.

Henry Larmers.—Drift opening; mine located near Warrensburg; coal 18 inches thick; product consumed in the immediate neighborhood.

B. B. Wood.—Drift opening; mine located near Warrensburg, and operated to supply home trade.

LAFAYETTE COUNTY.

Production, 299,931 tons.

The decrease in the production of coal in this county for the past year is quite large, being 19 per cent, or 71,977 tons less than it produced the previous year; and yet the decrease proportionately is much less than that of other large coal-producing counties. The average decrease for the entire State amounts to 25 per cent.

Coal mining in the State commenced in this county, thus making it the oldest coal-producing county. The coal will average only 18 inches in thickness, yet, because of the excellent quality and character of the coal, the nature and quality of its roof and under-mining, the fortunate location of the county with reference to good markets, its

superior transportation facilities and short hauls, enable its operators to compete successfully with other coal-fields having the advantage of thicker seams of coal.

For the details relating to its mining operations, see table under the head of "No. 6, Lafayette county."

Following may be found a description of the localities and condition of the mines.

CONCORDIA POSTOFFICE.

There are several small mines in the vicinity of Concordia, operating in the fall and winter to supply the home market. The thickness of the coal, mode of working and price paid for mining, is the same as that of other mines in this county.

Following are the names of some of the parties who operate these mines:

J. P. Hendricks.—Slope opening; located 5 miles west of Concordia.

A. F. Kreese.—Shaft 20 feet deep; located 5 miles west.

Henry Bartels.—Drift opening; mine located 5 miles south of Concordia. Coal consumed in the surrounding country.

CORDER POSTOFFICE.

Corder Coal Co., H. G. Smith, superintendent.—This company owns two mines at this place, but, owing to the very small demand for coal during the past winter, only one of them has been in operation the past year. This mine has a shaft 90 feet deep, steam plant. Ventilation is produced by an 8-foot fan, which was supplying the mine with the required quantity of air, divided into two splits. The roadways are high and fairly drained, but water collects in many places on the roads. Too much economy is practiced here, and, as a result, cannot pronounce the mine in good condition. It is one of the oldest mines in the country, and is extensively worked; the pit-head, cages and safety-catches are very much in need of repair; coal 18 inches thick, and worked on the long-wall system, with the face movable track. A layer of black slate about a foot thick comes down with the coal, and is used to build pack-walls—no props being used at any of the mines in this locality. There were about 80 men employed on dates of inspection—September 16, November 27 and April 4. The coal is shipped over the Chicago & Alton railroad.

Hoppyville mine is located north of Corder and operated by J. White Lewis. Shaft opening, using horse-power for hoisting, and employing few men in winter, to supply the local trade.

W. H. Bell operates a mine one mile south of Corder; shaft 22 feet deep; horse-power; coal consumed in the surrounding country.

J. H. DeBolt is operating a mine $1\frac{1}{2}$ mile southwest of Corder; slope opening; coal consumed in the neighborhood.

W. W. Morgan.—Mine located southwest of Corder, and operated to supply home trade.

Salt Fork Coal Co.—Mine located one-fourth of a mile east of Corder, and connected with the C. & A. R. R. This is a new mine sunk in the summer of 1893, and coal found at a depth of 48 feet. It is the same seam as that worked at other parts of the county, but of a superior quality. The hoisting apparatus is a well-constructed horse-power. I visited the mine Sept. 16, but as no provision for the circulation of the air had been made, I did not inspect the mine. Nov. 27 I visited the mine again, and found it opened up practically, with 17 men at work. April 4 made another inspection, and found the ventilation deficient, as no fire was kept in the furnace; the company was instructed to keep the mine better ventilated, and to sink an escape-shaft at once.

DOVER POSTOFFICE.

Dover Coal company.—F. Davis, superintendent. This mine is located on a high bluff on the south side of the Missouri river, and connected with the Boonville & Lexington branch of the Mo. Pac. railroad. The mine is elevated one hundred feet above the railroad track, and the coal is let down an incline plane; the loaded cars bring up the empty. This is a drift opening, and ventilation is furnished by a furnace located at still another drift to same mine opened on the east side. The ventilation was not up to the requirements of the law, owing to its small and contracted airways. The company was notified to remedy the evil at once, and we are pleased to state that our instructions were promptly complied with. The roadways are very wet and the mine making considerable water. Coal is about 18 inches thick, worked on the long-wall plan. About 30 men employed. Coal shipped and consumed at Kansas City.

N. F. Fox operates a mine about two miles east of Dover. Shaft 40 feet deep; horse-power; employs five men in fall and winter to supply the home demand.

HIGGINSVILLE POSTOFFICE.

Higginsville is located near the center of Lafayette county, 12 miles east of Lexington, and is surrounded by coal mines, all of which have good shipping facilities, as the C. & A. and Mo. Pac. R. R. both pass through the coal field. There are 18 mines, large and small, in

the immediate vicinity, of which 11 are connected with railroads, and are shipping their product to the market, while the seven remaining mines are operated to supply the home trade.

Bonanza Coal Company.—Wm. Brandaw, manager. Mine located two miles east of Higginsville, on the line of the C. & A. railway; shaft 70 feet deep, and coal is brought to the surface by horse power; ventilation is produced by a furnace located near hoisting-shaft, and was giving good results. Inspections were made November 28 and April 4, and mine found in good condition on both visits; the main entries had been made higher by blasting down the rock, and mules will soon be put in mine. The hoisting apparatus was found in poor condition on both inspections, and was condemned, and the company contemplates steam-power during the summer. The coal is about 18 inches thick, and worked on the long-wall plan; from 35 to 40 men employed; the coal is shipped over the C. & A. to Kansas City and points west.

Bruce & Noble.—J. D. Bruce, manager. Mine located $1\frac{1}{2}$ miles southwest of Higginsville, and connected by switches with the C. & A. and Mo. Pac. railways; shaft 25 feet deep; horse-power; mine ventilated by a furnace, and worked on the long-wall method; inspections were made September 15 and April 5, and mine found in very fair condition on both visits; coal 18 inches thick, and the same seam as that worked at other mines in the same vicinity; about 35 men employed, and the output shipped to Kansas City and points west.

Campbell mine.—Thomas Thomas, superintendent. Mine located near the city limits on the west side of Higginsville, and connected with the C. & A. railroad. The shaft is 70 feet deep and operated by steam-power. Ventilation is furnished by a 10-foot fan, which was giving good results at dates of inspection, September 15 and April 5. On first inspection, the air was conducted from the bottom of hoisting-shaft to the face of north entry, where it splits, part going to the east and part to the west side, and often traveling through the face of the workings, and meets again at face of south entry and returns to the fan.

On second inspection, I found the north and northeast parts of the mine had been temporarily abandoned and the work confined to the south side of the shaft. Coal is about 17 inches thick, and is worked on the long-wall plan; roadways high and dry and mine in good condition. About 75 men employed. Most of the coal is consumed at Kansas City.

Frank Coleman.—Operates a drift mine two miles southeast of Higginsville to supply the home trade.

Chas. E. Duncan.—Operates a mine two miles southeast of Higginsville. Drift opening. Worked on the long-wall plan, employing few men in fall and winter to supply the home trade.

Farmers' Coal company.—Thos. Thomas, superintendent. This mine is located one mile southwest of Higginsville, and has shipping connections with the C. & A. and Mo. Pac. railways by a switch; shaft 36 feet deep; horse-power; ventilation is furnished by a furnace, and the mine is well ventilated, a large volume of air being forced around the entire face of the workings.

An under-ground connection will soon be made with the Campbell mine, when both mines will be working on the same face of coal. Coal 17 inches thick and worked on the long-wall plan; from 30 to 40 men employed. The output from this and the surrounding mines is consumed at Kansas City. It is a very good coal, and is highly recommended as a good domestic fuel, and sells for a better price than any other Missouri coal in the Kansas City market.

Hagood Coal Company, J. E. Gunn, Manager.—This mine is located on the same coalswitch as the Farmers' mine, and has the same shipping facilities. It is located half mile northwest of the latter, and 1½ miles southwest of Higginsville; shaft 20 feet deep, and operated by horse-power; mine well ventilated and worked on the long-wall plan; from 15 to 20 men employed. The product is consumed at Kansas City and points west.

John Longest operates a mine near Higginsville in the fall and winter to supply home market.

Frank Kester.—Mine located three miles southwest of Higginsville; shaft 80 feet deep; horse-power. Thickness of coal and mode of mining the same as that of other mines in the vicinity; the mine only operates in fall and winter to supply home demand.

Rocky Branch Coal Company, M. L. Belt, manager. This company operates two mines in this vicinity; both have drift-openings, and are ventilated by furnaces. The mines are located one and one-half miles west of Higginsville; connected by switches with the Chicago & Alton and the Missouri Pacific railways.

First inspection was made of Mine No. 1 on November 29, and the ventilation was found deficient in all parts of the mine—in fact, there was not air enough passing through the mine to move the air meter. There were 45 men at work in the mine at this date, and as the law provides for 100 cubic feet per man per minute, there should have been 4,500 cubic feet of air passing per minute at that date through *the mine*. To pass that amount of air through a circular pipe 18 inches in diameter, the area of which is only one and three-fourths of a foot.

would require the air to travel at a velocity of 28 miles per hour, with a propelling force of four pounds to the square foot. The company was notified of the deficiency and instructed to enlarge the area for the outlet of the air. April 5 I visited the mine again, and found only a few men at work making some repairs, and as there was no fire in the furnace, no test of the air was made. The circular pipe had been taken down, and a square smoke-stack $2\frac{1}{2} \times 1\frac{1}{2}$ feet built in its place, increasing the area two square feet, making it $3\frac{1}{2}$ feet, which is entirely too small for the capacity of the mine. Mine No. 2 was not running at date of my visits, hence no inspection was made. Coal 18 inches thick and worked on the long-wall plan. This is the same seam of coal as that so extensively worked in other parts of the county, and price paid for mining the same. The output is consumed at points west.

A. C. Lee operates a mine near the Rocky branch. Drift opening, only running in fall and winter to supply home consumption.

Alex. Parady operates a local mine on the west side of Higginsville.

John O'Malley.—Slope opening; operating in fall and winter to supply the local trade.

Stealey & Fowler Coal Co.—G. W. Stealey, manager. This company is operating three mines, all of which have railroad connections. They are located about $1\frac{1}{2}$ miles southwest of Higginsville. First inspection of Mine No. 1 was made September 15. The mine was closed down during the summer months and filled with water. It was reopened the first week in September, and was in very fair condition at date of my inspection, with about 30 men at work. The shaft is 19 feet deep; horse-power. Coal 18 inches thick, worked on the long-wall plan, and product shipped to Kansas City and points west.

No. 2 is located about $\frac{1}{4}$ of a mile west of No. 1. The shaft is 20 feet deep; horse-power. Ventilation is furnished by a furnace, which was supplying a good current of air and passing it along the face of the workings. Second inspection was made April 5, and the mine found in very good condition. The thickness of the coal, mode of working, and price paid for mining, is the same as that of other mines in this locality. About 30 men are employed. The coal is shipped to points west and northwest.

No. 3 is a slope opening. Very little work has been done at this mine during the past year. A few Bohemians have a contract to load coal in cars at a given price. The mine is operated on a small scale in the fall and winter.

Taggart & Anderson.—Mine located 1½ miles southwest of Higginsville. Drift opening. Coal 18 inches thick. Mining done on the long-wall plan, and operated in fall and winter to supply the home market.

Hawkins & Smith.—Mine operated by J. E. Wilkes; located one mile west of Higginsville; shaft 72 feet deep; horse-power; ventilation is furnished by a furnace located near hoisting-shaft, and was giving good results. This mine, while located on the line of the O. & A. R. R., has no shipping connection with it, and though only supplying the local demand, it makes a very good showing of output yearly; coal 18 inches in thickness, and worked on the room and pillar plan; employing from 15 to 20 men in winter, and a few in summer; the product is consumed at Higginsville and vicinity.

The Y. S. A. Coal Co.—Wm. Ballew, superintendent; mine located two miles west of Higginsville, and connected with the O. & A. R. R.; shaft 45 feet deep; equipped with steam-power; considerable improvement has been made at this mine during the past year; the hoisting-shaft has been retimbered, the furnace rebuilt and enlarged, and another air-shaft sunk. The distance that the air had to travel has been shortened, and the furnace was giving better results than on former inspections. Two inspections of this mine were made September 15 and April 5, respectively, and found in very good condition, with machinery, cages, ropes and safety-catches in good working order. Thickness of coal, mode of working and price paid for mining is the same as that at other mines in the county; about 40 men employed, and the output is shipped to points west and northwest.

LEXINGTON POSTOFFICE.

Lexington is surrounded by coal mines, and is one of the best mining points in the State; while the seam is only 18 inches in thickness, yet, with the quality of the coal, the nature of the roof and the economic mode of the long-wall working, which is so suitable to this coal seam, enables the operators to compete in the market with other districts where a thicker coal seam is mined. Mining has been carried on in this locality for a great number of years, and comparatively speaking, mining is yet in its infancy here, as the seam is almost inexhaustible. There are 16 mines, large and small, in the immediate vicinity of Lexington, which give employment to nearly 1000 men in the winter months, and about 600 in summer months. Following will be found a description of each mine, with a statement as to location, and condition in which they were found at dates of inspection:

Bell & Greer.—Mine located south of Lexington. It has two drift openings, and ventilated by a small furnace. Coal 18 inches thick and worked on the long-wall plan; employing about 12 men in winter and 4 in summer to supply home demand.

Mike Hollwell.—Mine located in Lexington. Shaft 60 feet deep; horse-power; operating in fall and winter to supply the home trade.

F. S. Kelly.—Mine located east of Lexington, near the river. Drift opening, and ventilated by a furnace giving good results. This mine, like all the other mines in this locality, is worked on the same method, and paying the same price for mining. The product of the mine is consumed at Lexington.

Lafayette Coal Co., W. F. Kerdolff, superintendent.—Mine located 5 miles east of Lexington, and connected with the Boonville branch of the Missouri Pac. R. R. Drift opening, and mine ventilated by a furnace. Inspection of this mine was made September 13, and it was found in better condition than on any former visit. The air-shaft had been widened and a larger furnace built, and the ventilation much better than on last inspection. Coal 18 inches thick, and worked on the long-wall plan; about 40 men employed; the product is shipped to Kansas City and other points west.

Keist & Riley.—Mine located 1 mile south of Lexington. Shaft 60 feet deep; horse-power. This is a new mine sunk in the summer of 1893, and operated to supply the local demand; about 6 men at work at date of inspection.

Keist mine, a small drift near Lexington, supplying local trade.

Morris Bros.—Mine located west of Lexington. Drift opening; operated in fall and winter to supply home consumption.

Henry Macey.—Mine located two miles west of Lexington, and connected with the Lexington & Kansas City branch of the Missouri Pacific railroad; drift opening, and ventilation secured by a furnace, which was giving good results at dates of inspection—September 12 and April 9. The furnace had been enlarged and stack built higher; ventilation much better than on former inspection, and the mine is in much better condition generally. Thickness of coal, mode of working and price paid for mining is the same as that of other mines in this locality; from 30 to 40 men employed, and the product is shipped to Kansas City and points west.

A. O'Malley operates a mine southwest of Lexington; shaft 25 feet deep; horse-power; running in fall and winter to supply home trade.

S. Spruce operates a mine east of Lexington in the fall and winter to supply home demand.

Thomas Walton.—Drift opening, and ventilated by a furnace; from 6 to 10 men employed in fall and winter; coal consumed at Lexington.

The McGrew mines are located 4 miles west of Lexington, and are connected with the Lexington & Kansas City branch of the Mo. Pac. railroad. Both mines have drift openings, and are worked on the same coal face, and are ventilated by the same fan; and for all practical purposes may be considered as one mine with two openings. The air enters at the extreme east end of mine No. 1, and travels along the face of the workings westward, thence through mine No. 2 into another opening, where the fan is located. The ventilation was found good at both dates of inspection, Sept. 12 and April 6.

Considerable improvement has been made at these mines during the past year. The rock has been taken down in all the entries, and mules have been put in the mines to haul out the coal, in place of men. Good doors have been put up to properly conduct the air, and the mine found in first-class condition. The coal is about 18 inches thick, and is worked on the long-wall plan; a layer of slate comes down with the coal, which is used to build walls to support the roof, as no props are used in the mine. In the winter months there are about 120 men employed here, and about half as many in summer. The product is consumed at Kansas City and points west.

Lexington Coal Co., Major R. M. McDowell, general manager; B. F. Wiley, superintendent.—This company owns and is operating 6 mines in this county, all located on the south side of the Missouri river, east and west of Lexington. The mines are worked on the long-wall system, and the price paid for mining is the same as that of other mines in this locality. The thickness of the coal on the west side of Lexington is about 18 inches, while on the east side it is thicker, and runs as high as 26 inches in the McDowell shaft. The mines of this company are well ventilated, and the requirements of the mining law closely observed. The road-ways are high, dry and in good condition. All of the mines have shipping connections with the river branch of the Mo. Pac. R. R.

Graddy mine.—Drift opening; located $2\frac{1}{2}$ miles west of Lexington. The coal at this mine is undermined by an electric plant, of which we made mention in the last report, and as the enterprise was at that time in its experimental stage, we promised at a future date to furnish further information concerning the enterprise, and at our request, Mr. Wiley kindly replies as follows:

"Machines have each averaged daily 440 lineal feet; undermined $2\frac{1}{2}$ feet, or 1100 superficial feet of mining. In short, each machine mines from 60 to 75 tons of coal per day of 9 hours, from a 20-inch vein.

The cost of the product therefrom has been but very slightly diminished as compared with that from other mines of this company. However, when some of the parts shall have been perfected, and the machines otherwise developed as the nature of the required work demands, and also when repairs can be furnished promptly and cheaply, then we shall have an economical and reliable machine suitable for long-wall mining. While the results of the under-cutting have proven satisfactory, the wear and tear has been very great, and the item of maintenance has been expensive. Five men are required to operate each machine."

The mine is ventilated by a furnace which was giving good results at the date of inspection. Roadways high and dry. About 50 men employed.

Hackett mine, located two miles west of Lexington, and one-half mile east of Graddy mine; drift opening, and ventilated by a furnace. First inspection of this mine was made September 12, when it was found in very fair condition, with 45 men at work. April 6, another visit was made to this mine, and found the men at work taking out the rails; since then the mine has been abandoned.

Seawell mine is located on the east side of the Hackett mine, and has an underground connection with the latter. It has a drift opening; the character of the coal, mode of working and price paid for mining is the same as that of other mines around Lexington; ventilation is furnished by a furnace, which was giving satisfaction. This mine had been abandoned for several years and was reopened this year; about 25 men at work at date of first visit, September 12; I visited the mine again April 6, and found it idle owing to the great depression in the coal trade.

Hartman mine, located one mile west of Wellington. This mine was formerly operated by C. H. Hartman; it was sold to the Lexington Coal Co. in June, 1893. Considerable improvement has been made at this mine since this company took charge. A new furnace has been built and the shaft retimbered; roadways have been made higher and cleaned, and the ventilation greatly improved; a new pit-head has been erected, and machinery will soon be substituted for the horse-power now used to do the hoisting. The shaft is 35 feet deep, and the character of the coal, mode of mining and prices paid for work are the same as that at other mines in this county.

The McDowell shaft is located one mile east of Lexington; it is 55 feet deep and equipped with good machinery. Ventilation is furnished by a 10-foot fan, which was causing 17,350 cubic feet of air per minute to circulate around the workings at date of first inspection

September 14. This mine, like all the other mines operated by this company, had undergone some repairs since my former visit. The air-ways had been enlarged and cleaned, and several new doors had been set, and altogether the mine was found in first-class condition, with about 125 men at work. Second visit was made April 9; found the mine closed down for the summer, owing to the great depression in the coal trade; there were a few men at work blasting the roof and doing other repairs in the mine.

The Riverton mine is located one mile east of the McDowell mine, and two miles east of Lexington. Drift opening, and ventilated by furnace. First inspection was made September 13, and the return air-ways were found cleaned and enlarged; new doors had been put up, as instructed on former inspection, with the result of an increased volume of air in the mine. The ventilation was found above the requirements of the law, and the general condition of the mine was good, with about 100 men at work. Another visit was made April 9, but as the mine was not running, no inspection was made. Thickness of coal, mode of working, and price of mining, is the same as that at other mines in this locality. The product of the mines operated by this company is shipped in all directions, and a large percentage of it is consumed by the railroad company.

The Southwestern Coal Co. — Mine located at Lexington, near depot, and connected with the Mo. Pac. R. R. This is a new mine, sunk in September, 1893. Coal was found at a depth of 125 feet, and the shipment of coal commenced in November of the same year. The mine is equipped with first-class machinery, and will be worked extensively and practically. Ventilation produced by a 10-foot fan, located on top of an air-chamber partitioned off one side of hoisting-shaft. The present location of the fan is a temporary arrangement, as the company is now at work sinking an escape-shaft, 6×10 feet, and which will be partitioned off into two compartments, one to be used for the passage of air, and in the other a stair-way will be built. Considerable water is encountered in this mine, which comes from the roof and gives the pumps plenty to do to keep it down. Coal 18 inches thick, worked on the long-wall plan. The coal is shipped to Kansas City and points west.

MAYVIEW POSTOFFICE.

Mathews Coal Company, W. B. Wilson, manager.— This company owns and is operating two mines located at Mayview. Mine No. 1 has a shipping connection with the C. & A. R. R. Shaft 105 feet deep; equipped with good machinery for hoisting.

The mine is worked on the long-wall system, and ventilated by a furnace which was giving satisfaction on both dates of inspection. This

is the same seam of coal as that worked at Higginsville, Corder and in other parts of this county; its thickness, mode of working and the price paid for mining, are the same as at other mines in this district.

About 50 men are employed, and the product is shipped westward.

No. 2 is a new mine, located on the west side of Mayview, shaft 135 feet deep; equipped with good machinery; engine, boiler, ropes and cages are all new, and the pit-head and tippie-house well-constructed. The air-shaft had been completed and a stairway put in, and everything about the mine made in conformity with the law. While this mine is located on the line of the C. & A. railroad, yet it has no shipping connection with it, and was only supplying the home trade at dates of my visits.

J. J. Norfleet operates a mine northeast of Mayview. Shaft 28 feet deep; horse-power; operated in fall and winter to fill the home demand.

NAPOLEON POSTOFFICE.

Brown & Bowers Coal Co., James Hoge, foreman.—Mine located 1 mile east of Napoleon, on the Lexington & Kansas City branch of the Mo. Pac. R. R. Shaft 60 feet deep; steam-power. Inspection was made September 11th, and the mine found in very fair shape. Ventilation is furnished by a furnace, giving very good results. The coal is 18 inches thick and worked on the long-wall system. Mine is well drained, and about 25 men are employed. The product is shipped west.

Napoleon Coal Co.—Located east of Napoleon, mine not working at date of my visit. The plant was burned down some time in November, 1893, and has not been rebuilt.

WELLINGTON POSTOFFICE.

Andrew Carter operates a mine 1 mile east of Wellington. Drift opening; employing few men in winter to supply home trade.

J. M. Seawall & Co.—Mine located 1 mile west of Wellington; connected with the L. & K. C. branch of the Mo. Pac. R. R. Shaft 45 feet deep; horse-power. The ventilation (which is furnished by a furnace) was found considerably better than on former inspection. The furnace had been enlarged and air-ways cleaned, and a larger volume of air was found traveling around the workings. Ropes and safety-catches in poor condition, with no gates at pit-openings. Instructions were given the company to remedy these evils at once. April 10 I visited the mine again, and found a new rope had been put in place of the old one which was condemned, and the safety-catches repaired, but no gates had been put around shaft-opening. Thickness of coal, mode of working and price paid for mining, is the same as that paid at

other mines in this part of the county. At dates of inspection, September 11th and April 10th, 20 men were employed. Coal shipped westward.

Wellington Coal Co., M. V. L. McClelland, manager.—Mine $\frac{1}{2}$ mile east of depot at Wellington, and connected with the L. & K. O. branch of the Mo. Pac. R. R.; shaft 33 feet deep; hoisting by horse. First inspection of the mine was made September 11, at which time the ventilation was found up to the requirements of the law, and the mine in very fair condition, with the exception that it was very wet at face of the workings. The seam dips to the south, in which direction the mine work is progressing; the water following the face makes it very disagreeable work. This mine, like all other mines in the vicinity of Lexington, is worked on the long-wall plan, and the same price is paid for mining; about 25 men are employed, and the coal is shipped to Kansas City.

WAVERLY POSTOFFICE.

There are two mines located at Waverly—one on the east and one on the west side of the depot, and both have shipping connection with the Boonville and Lexington branch of the Mo. Pac. R. R.; both mines have shafts opening about the same depth to the coal, and are working the same seam, and will prove good mines if practically managed; but very little work has been done at either of the mines during the past year. In the spring and summer of 1893, the mines were leased to C. O. Godfrey & Co.; the head of this firm had never yet succeeded in operating mines in this State, and his management of these mines proved no exception. The mines laid idle until fall, when the owners took charge again. I made another visit on the 30th of November, and found a few men at work in each shaft, sending out coal to supply home demand. No effort had been made by either of the companies to sink an escape-shaft, which I ordered sunk in May, 1893, in compliance with the mining law. I notified each company that the escape-shafts must be sunk at once, or the mines would be closed. The Waverly Coal Co., operating the east mine, notified this department that it had closed the mine, as it could not see its way clear to comply with the law. On the 18th day of January another letter was received from the same company, stating that it had made arrangements to sink an escape-shaft, and that work had already commenced.

February 2, I made another visit to Waverly, and found the escape-shaft down 35 feet, and the work progressing nicely. There were 6 men at work in the mine, sending out coal to supply the home market. April 18, I made another visit to this mine, and found the *escape-shaft* completed, the stairway erected, and 4 men at work in the

ine. The coal in this mine will run from $3\frac{1}{2}$ to 4 feet in thickness, and runs level and regular. It is overlaid with an excellent slate roof, which stands well in entries, airways and rooms, if properly managed; but the mine has been neglected and badly managed; however, it can be made a good mine by a practical miner at a very small expense. The mine is equipped with machinery for hoisting, and is practically a dry mine with very good roadways.

Francisco mine is located 1 mile west of depot. Shaft 110 feet; steam-power used for hoisting. The mine has been idle nearly all the year; a party leased it in the fall, and got out some coal to supply the home demand. In April, a party of miners from Higbee, Mo., leased the mine, took out the water, cleaned it up and started to operate, but the strike coming on, they went back home and the mine has remained idle. The mine generates considerable gas, and Mr. Francisco has been notified by this department that an escapement-shaft must be sunk before the mine will be allowed to be operated.

LINN COUNTY.

Production, 61,807 tons.

Linn county is now considered as one of the large coal-producing counties of the State. Her principal mines are located at Brookfield and Marceline, although coal is mined in other sections of the county.

The report for 1893 shows the output to have been 48,302 tons, while in this report it is given at 61,807 tons, valued at \$1.54 per ton, or \$95,221, an increase over the preceding year of 13,505 tons, but a decrease in the price received of 3 cents per ton. In producing this amount of coal 6 mines were operated, and an average of 175 men employed.

Following is a description of the principal mines, with a statement as to their condition at dates of inspection:

BROOKFIELD POSTOFFICE.

Brookfield Coal Co., B. F. Smithers, president; Geo. Clark, superintendent.—Mine located $\frac{1}{4}$ mile east of Brookfield, on the Hannibal & St. Joe railroad. Shaft 155 feet deep; equipped with steam-power for hoisting.

This is a new mine, opened out in the summer of 1893. First inspection of this mine was made October 25, and found that the entries had been just started off the bottom to connect with the air-course, to have a circulation of air around the works.

Second inspection was made February 20, when we found the connection had been made, and a good current of air was found traveling

through the face of the workings, by the aid of a small fire built at the foot of the air-shaft. The coal is about 26 inches thick, and is worked on the long-wall plan, with clay mining. The roof is a hard mixture of slate and soapstone, which is very friable and requires considerable timbering to keep secured. The mine is practically dry. From 15 to 20 men employed in the fall and winter. All the coal is consumed at Brookfield and surrounding country.

Bottomly mine.—Located $1\frac{1}{2}$ miles east of Brookfield. Shaft 150 feet deep; horse-power. The hoisting apparatus was found in an unsafe condition, and instructions were given to retimber the shaft and put safety-catches on cages, and put on a new hoisting-rope, and to sink an escape-shaft at once. Coal 28 inches thick, and worked on the long-wall plan, giving employment to 6 or 8 men in the fall and winter to supply the local demand. All the coal from this mine is consumed at Brookfield and vicinity.

Clark mine.—Located 2 miles east of Brookfield and north of the Bottomly. Shaft 140 feet deep; horse-power. On our first visit to this mine, October 25, we found the cages without bonnets or safeties, and the hoisting apparatus in an unsafe condition. Instructions were given to Mr. Clark to remedy these evils within ten days. November 11 we visited the mine again and found that our instructions had been complied with. February 20 we made another inspection of the mine, and found that a new rope had been put in to replace the old one, which we condemned on former inspection. The gin had been remodeled and the mine was found in better and safer condition.

The coal is 28 inches thick, and worked on the long-wall plan. From 6 to 10 men employed. The coal is hauled away from the mine in wagons and consumed in the immediate vicinity.

Bernard Shafer.—Mine located 3 miles east of Brookfield. Shaft 155 feet deep, using horse-power for hoisting. Coal 26 inches thick and worked on the long-wall plan, employing from 4 to 8 men in fall and winter to supply local trade. Ventilation is furnished by a small furnace, giving good results. Cages, safeties and ropes in good working order.

MARCELINE POSTOFFICE.

Marceline Coal Co., Joseph Hemmings, superintendent; Pete McCall, foreman.—Mine located at Marceline, connected by a switch with the Santa Fe R. R. Shaft 187 feet deep, equipped with first class machinery. All the safety appliances were found in good working order, with all the requirements of the mining law closely observed and obeyed. The ventilation is produced by a 14-foot fan, which was giving good satisfaction.

Two inspections have been made of this mine during the year. First inspection was made October 26, when the fan was found to be running 48 revolutions per minute, removing 21,000 cubic feet of air in same time, which was well circulated around the face of the workings, and 130 men at work. Second inspection was made February 18, when the fan was found to be making 55 revolutions per minute, and removing 24,680 cubic feet of air in same time, which was well distributed around the workings. The air volume is divided into four divisions and each division ventilates a separate district in the mine. The main current travels the north and south entries to face of workings, where it is divided into the east and west entries, and returning to the fan-shaft over an air crossing. The system of ventilating this mine is very practical, and is one of the best ventilated mines in the State; all the airways are high, wide and clean, showing that the foreman is doing his duty, and we only wish that more of the mine bosses of this State would follow the example of Mr. McCall. Coal about 26 inches thick, and worked on the long-wall plan. The roof is hard and strong, and well adapted for this method of mining. There were about 200 men at work in the mine on date of second visit. The mine was formerly owned by the Kansas & Texas Coal company, but sold out last summer to the Marceline Coal company, which operates the mine at present. Coal consumed by the Santa Fe railroad.

Landreth & Son are operating a mine near Marceline. Shaft 130 feet deep; horse-power; coal 26 inches thick, and worked on the long-wall system. From 4 to 10 men employed in fall and winter to supply local demand.

LIVINGSTON COUNTY.

Production, 800 tons.

There is but one mine in this county now in operation, which is located five miles north of Chillicothe; shaft 65 feet deep; horse-power; coal from 20 to 22 inches in thickness, and worked on the room and pillar plan; the coal is overlaid by soapstone, which makes a very good roof. Several other mines in this vicinity have been worked in past years, and are now abandoned, the coal being worked out.

MACON COUNTY.

Production, 511,566 tons.

This county continues in the lead of coal-producing counties, in the amount of coal mined. For the past year, as our tables show, a decrease in the production, compared with the previous year, amounting to 276,997 tons, or 34%, as the result of business depression and strikes. The average price received at the mines, per ton of coal, was

\$1.07, and the total proceeds from the sale amounts to \$546,772. For the detailed information relating to the respective mines, see table No. 6, and for the location and condition of the same, see the remarks following :

ARDMORE POSTOFFICE.

Kansas & Texas Coal Co., B. F. Hobart, President, E. J. Crandell, General Manager, and W. E. Marlin, superintendent.—In the report of this department for 1893, it will be seen that this company was operating nine mines at Ardmore, but owing to the small demand for coal seven of the mines were closed down, and only two were operated during the past year. This company is a great factor in the coal production of the State, its mines producing one-sixth of the total output. All of its mines are equipped with good machinery, and are kept in good condition, with the requirements of the law strictly observed.

Mine No. 33, George Burge, foreman.—This mine has a slope opening and the coal is brought to the surface by the cable rope system, which is the most economical as well as the most rapid method of hauling coal of any system as yet introduced in mines. Should the demand for coal justify the company to put on more men and run this mine to its full capacity, it could turn out as large an output as at date of my last visit, at which time 800 tons was taken out and handled in the forenoon. Ventilation is produced by a 12-foot fan, which was running at a speed of about 75 revolutions per minute, and passing a large volume of air around the mine. The airways are large and clean, and the mine is well ventilated. The mine is opened up very extensively, but the coal is faulty and irregular. It will average in thickness about 4 feet. The roof overlying the coal is a mixture of slate and soapstone, very soft and of friable nature, requiring great care and expense to keep the same properly secured with timber. The mine is worked on the double entry pillar and room plan, and the coal is worked by shooting off the solid; which method is dangerous as well as impractical. Two inspections of this mine were made during the past year, Sept. 25 and March 21, and found in good condition on both dates. A strong current of air was found circulating around the face of all the entries. Roadways are high and dry and in good condition. Mine furnishes employment to about 140 men and boys.

Mine No. 48.—George Morris, foreman. Shaft 60 feet deep, and equipped with first-class machinery, all of which is kept in good repair and all the safety appliances were found in a safe condition. A self-dumping cage has been put in operation at this mine during the past year, which has proven a great saving of labor; the coal is dumped *direct from the cage to the hopper*, where it is weighed, and then run

over the screen; everything about the contrivance is self-acting, and the weighman has nothing to do but take the miners' check off the car and give the signal to go; thus one man can handle as much coal in a day as three or four could by the former system. The mine is ventilated by a 12-foot fan, which was giving good results on dates of inspection, September 25 and March 21. The air was found circulating around the face of the entries in two separate currents, and giving plenty of air to each working place. Wooden doors had been set on main entries in place of canvas ones, as found on previous inspection. Doors were also set at all the cross-entries, where permanent doors were necessary, and the mine was well ventilated. The mine is making considerable water, which is found in pockets along the roadways in all the east entries; but during the past year the company has done a large amount of ditching and corduroying of the roads, which makes them perfectly dry, and a great improvement is observed in the mine. Coal runs from 4 to 5½ feet in thickness, but the roof which overlies it on the west side is very soft, and in some of the rooms about a foot of the coal is left up to help support the roof, and all the entries have to be timbered. The mine is worked on the double-entry room and pillar method. Employment is furnished to about 100 men and boys. The product is hauled over a switch running from the mine to Excello, where it is shipped over the Wabash railroad to points north and west, but a very large amount of coal is consumed by the Wabash R. R. Co.

BEVIER POSTOFFICE.

The mines in the vicinity of Bevier have not been as productive during the past year as the previous one, owing to the great depression in the coal trade and the national strike amongst the miners. Had business been as good, with no trouble from strikes, these mines would have shown a handsome increase in their production; as two new mines have been opened up here during the past year, and the capacity of some of the other mines has been enlarged. There are eight mines in the immediate vicinity of Bevier, all of which are equipped with good machinery, and are extensively worked; all the mines are working the same vein of coal, which will average about four feet in thickness; it is very irregular and faulty in places, and runs into low coal; this is the same seam as that so extensively worked in the mines of Randolph county, and is the largest coal field as yet discovered in the State. Formerly the coal was worked here by shooting off the solid, but that method proving impractical and expensive, by causing too much waste of coal, the operators notified the miners that on and after a given date in February, 1894, all coal had to be mined on the

bench and cut on the side before the same be shot down. The proposed change, they claimed, would add greatly to the sanitary condition of these mines, as well as to the safety of the miner, besides giving the operator much better coal for the market; and after a consultation the majority of the employes of these mines, being practical miners and good pickmen, the operators' terms were accepted, and the men went to work, and though the daily output of every miner be decreased from 15 to 20 per cent by the change made in the mode of mining, yet the miners went to work for the same price per ton as that paid for shooting off the solid, which was equivalent to a reduction.

The roof varies in the character of its formation, with either slate soapstone or sandstone overlying the coal, and requiring considerable care and expense in timbering and keeping same secure. In fact, not enough care is taken with this roof, as the table on accidents will show that 99 per cent of the accidents happening in Macon county was caused by falls of roof.

Price paid for mining is the same as at all the mines, namely: 50 cents per ton for unscreened coal.

Following is a description of each mine:

Kansas & Texas Coal Co.—Wm. Egly, superintendent. This company owns and is operating two mines in the vicinity of Bevier, both of which have shipping connections with the Hannibal & St. Joe railroad.

Mine No. 43 is located $1\frac{1}{2}$ miles southwest of Bevier. Shaft 140 feet deep, and equipped with good machinery. A self-dumping car was put in at this mine during the year, and the hoisting engine formerly used has been replaced by a larger one. A cable rope for underground haulage and a new engine to work same have also been put in at this mine during the past year. The mine is ventilated by a 10 foot fan, which was giving entire satisfaction.

On date of first inspection, Nov. 7, measurement of the air was taken on both sides of the shaft, and while enough air was found circulating around all the workings to comply with the requirements of the law, the same was very unevenly divided, as tests of the air showed that the north side was getting 19,755 cubic feet per minute of the volume, while there was only 42 men at work, and on the south side 15,350 cubic feet was passing with 105 men at work.

The foreman was instructed to erect regulators in the airways, as to regulate the air volume more equally around the workings.

On the 16th of February I visited the mine again and made another inspection. I found the required quantity of air circulating around the workings, but the same was so vitiated by black-damp as to render

it unfit to breathe. This mine is very extensively worked, and on the date of this visit there were 136 miners, 6 day hands, 3 underground bosses, 10 mules and 10 mule drivers working in the same air-current on the south side; the air had to travel up and down through 16 cross entries, which would be from 8000 to 10,000 feet in one undivided current passing old abandoned workings, where the decay of organic matter is constantly going on, and over stagnant water in entries and airways, which makes the air still more sluggish and heavy, and renders it positive poison before it reaches the last of the miners. I am surprised, at this late date, in this age of progress, to find men in charge of extensive and important mines, who are entirely unfamiliar with the workings of a mine, and totally ignorant of the first principles of mine ventilation. And again, in addition to the above-mentioned evils connected with this one current on the south side, a very large amount of powder is exploded every day at noon, which results in the presence of a large amount of smoke and carbonic oxide gas, which the miners have to inhale during the latter part of every day. Instructions were given to the superintendent on this date to erect some overcasts (or air crossings) and split the air into two or more currents. This department has been informed that the company is sinking an air-shaft at the face of the south entry, and that the same will be equipped with another fan to ventilate the south side. Coal varies from four to five feet in thickness, and is worked on the double-entry room and pillar plan. Fifty cents per ton is paid for mining unscreened coal. About 200 men employed. The product is shipped westward.

Mine No. 46, G. Michaels, foreman.—Mine located 2 miles south of Bevier and connected with the H. & St. Joe R. R. by a switch. This is the finest and best equipped mine in the State. The head-gear stands 60 feet high from surface to pulleys and 35 feet to landing. The tip-house is 100 feet long and 35 feet wide. A box-car loader was constructed here during the past year and a self-dumping cage put in operation; and that, with the jolting-screen, makes this the most elaborate and complete plant in Missouri. The engines are of the Litchfield build, with 18×36-inch cylinders, connected to a 6-foot drum, using 5 boilers alternately to generate steam. Ventilation is produced by a 12-foot fan, which was giving good results on dates of inspection.

I made my first visit to this mine on the 6th November, 1893, and found the ventilation good; but as only 18 men were at work on this date, no measurement of the air was taken, for on the 1st of October, 1893, the miners of Macon county struck for the regular winter price for mining, and as the miners were still out this mine, suffered considerable damage. While it remained idle falls of rock were found all

over the mine, but a force of men were at work cleaning up and putting the mine in working condition.

On November 8, 100 negroes arrived at the mine, having been imported here by the company to take the place of the white miners. The negroes are still working at the mine, the company having a written contract with them, to be in force until May, 1895. (A copy of this contract will be found following article on strikes in this report.)

Another inspection of this mine was made February 13, when the fan was found making 88 revolutions per minute, and 33,490 cubic feet of air traveling through the mine in same time. The volume of air was ventilating this mine in two separate currents, and was giving good satisfaction at dates of inspection. There are as many men working in this one current of air at this mine as there are at mine No. 43, but the volume of air here is more equally divided, making the air much fresher and purer. This mine was intended to be a great producer, and a large amount of money has been expended here for that purpose, but, unfortunately, the shaft was sunk on a faulty place and the coal is very irregular and low, and hundreds of yards of entries have been driven here at great cost, prospecting for better coal, with little success.

The mine is worked on the double-entry room and pillar plan; price paid for mining, 50 cents per ton for unscreened coal; mine dry, with good, high roadways. About 200 men and boys employed. The product is shipped to points west and northwest.

Loomis Coal Co., W. H. Loomis, general manager; L. Bradford, superintendent.—This company operates 4 mines in the vicinity of Bevier, all of which are connected with the Hannibal & St. Joe R. R. The mines are equipped with very good machinery for hoisting, draining and ventilating, and are furnishing employment for about 350 men.

Mine No. 1, James Davies, foreman.—Mine located near depot, and is the oldest mine in the State. The head-gear and top-building is rickety and in need of repairs, but as the mine is nearly worked out, it will soon be abandoned. Two inspections have been made of this mine during the past year, and at each inspection the ventilation was found above the demands of the law in quantity, but having such a distance to travel through old abandoned workings, the air was very thick with black damp. The mine is making a large amount of water, which comes from an old abandoned mine close by, and a powerful pump is kept at work night and day to keep the water down. Coal 4 feet thick, overlaid by good slate roof. Mine worked on the double-entry room and pillar plan, and 50 cents per ton is paid for mining *unscreened coal*. About 55 men employed.

Mine No. 4, Robt. Patterson, foreman.—Mine located at Bevier. Shaft 60 feet deep and equipped with very good machinery. This mine has been a great factor in the coal production of this county, but the south side of the mine is nearly worked out, and will soon be abandoned. The entries on the north side are driven nearly a mile from the bottom of the shaft, and a new cable rope was put in the mine during the past year for underground haulage, which does away with the use of 8 or 10 mules.

First inspection of this mine was made November 10, when the fan was making 75 revolutions per minute, and doing very little effective work, as very little air was circulating, and a deficiency was found in every part of the mine. This mine laid idle through the month of October, 1893, owing to a strike amongst the miners; and about the middle of the month the fan-house burnt down, which stopped the circulation in the mine, and water accumulated in the airways, causing great damage by caves and falls of the roof, and which retarded the air-current very much. The company was instructed to clean and enlarge the airways at once. On February 13, I inspected the mine again, and found deficiency in every part of the mine, and the men suffering for the want of air; but a connection was to be made between the straight north entry and the fourth east entry on the west side, which would shorten the traveling way of the air 4000 feet.

February 17, I made another visit to the mine, and found the connection made, and that the ventilation had been improved at least 100 per cent.

The ventilation was found stronger and the air purer on this date, than on any previous inspection. This is a poorly ventilated mine at best, as the air has to travel such a long distance in one undivided current, through such small contracted airways, where so much frictional resistance is encountered at bends and angles, in traveling through the mine. The fan at this date was making 100 revolutions per minute, which speed should be maintained at all times in order to supply the mine with sufficient air. Coal from 4 to 4½ feet thick, and is worked on the double entry room and pillar plan. Price paid for mining same as that at other mines in this locality. About 100 men employed. The product of the mine is shipped over the Hannibal & St. Joe R. R. to Kansas City and St. Joe.

Mine No. 7, Ed Opie, foreman.—Mine located one mile southwest of Bevier; shaft 55 feet deep; steam-power used for hoisting. This is a new mine opened up in the summer of 1893, and commenced the shipment of coal in September of same year, and at date of first inspection, November 7, all the work was confined to driving entries, which work

was done by the use of the Harrison mining machines; the same has been moved over here from No. 4, to open up the mine; an escapement shaft had been sunk, and a 10 foot ventilating-fan erected, and cross cuts had been driven. February 15 another inspection was made, and a permanent system of ventilation had been adopted; the air splits at the bottom of the down-cast, the main currents traveling the north and south entries, and dividing to the east and west side, making four separate currents, which is a practical method of ventilating extensive mines. I am pleased to notice, on my tours of inspection, that the very much improved method of splitting the volume of air into separate currents is so generally adopted, by nearly all our mine managers, at the opening out of new mines. This mine has been opened up in a practical way, and is kept in good condition. The machines had been taken out on this inspection, and mining was done in the old way; coal varies from four to five feet in thickness, and the mine is worked on the double-entry room and pillar plan; price paid for mining, 50 cents per ton for rough and tumble (run of mine); about 80 men and boys employed; the coal is shipped over the Hannibal and St. Joe R. R. to Kansas City, St. Joseph, points west and northwest.

Bevier Black Diamond Coal Co., Thos. Francis, superintendent. Mine located $1\frac{1}{2}$ mile southwest of Bevier, and connected with the Hannibal & St. Joe railroad by a switch. Shaft 60 feet deep, equipped with good machinery. Ventilation is produced by a 12-foot fan, making 75 revolutions per minute and giving good results. Two inspections have been made of this mine during the past year. First inspection was made on November 9, and it was found in good condition, with the ventilation above the requirements of the law. The volume of air splits at the downcast, and the main current travels the north and south entries, the largest quantity of air going south, where the largest number of men are working, and thence to the east and west entries circulating plenty of fresh air around the workings. Another inspection was made February 14, when the meter registered 31,980 cubic feet of air passing in one minute, and which was well distributed around the mine. Substantial wooden doors were found set in proper places, well hung and in good condition. There is one feature about this mine worthy of note; that is, not a canvas door was found in the mine. Coal will average from 4 to $4\frac{1}{2}$ feet in thickness, and runs very regular, in fact, more so than at any of the other mines, and it is considered the best mine in this locality. It is worked on the double-entry room and pillar plan. Considerable water is encountered here, and powerful pumps are used to throw the same out. Ditches have been



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ade, and the roads corduroyed, making the same dryer and in better condition than found on any previous inspection.

About 150 men and boys employed. The coal is shipped over the Hannibal & St. Joe railroad to Kansas City and St. Joe and points west.

Watson Coal Co.—W. S. Watson, manager; W. M. Rivers, superintendent.—This company operates two mines in this locality at present. One of the mines is nearly worked out, while the other is a new mine, opened up last winter. The old mine is located at Bevier; shaft 70 feet deep, and steam-power used for hoisting; ventilation is produced by a 10-foot fan, and mine is now and always has been well ventilated. Its operations cover a great number of years, and is extensively and practically worked, and, in fact, it is in better condition now, at the last stage of its existence, than two-thirds of the mines of the State. All of the men have been engaged in drawing back pillars for some time, and the mine will soon be abandoned.

The Watson new mine is located about one and one-half miles south of Bevier, and connected with the Hannibal & St. Joe railroad by a switch extending from the main track. Shaft 35 feet deep, and equipped with first-class machinery, all of which is new and well constructed. The engines were built by Wright & Adams of Quincy, Ill. The cylinders are 13×26 inches, connected to a 5-foot drum working on first motion. The machinery is set on good rock foundations, and enclosed by a good brick house. An escapement-shaft has been sunk and a 12-foot fan erected. The shaft is partitioned off in two compartments—one compartment used for the air to travel, and a stairway has been erected in the other for escape. The head-gear and top buildings are well constructed for every convenience and economy. The cages are new and strongly built, and supplied with the latest improved safety-catches. New hoisting ropes have also been put on, making this one of the best constructed plants in the State.

First visit to this mine was made November 7, 1893, but as the entries had only been started, there was not enough of the mine open to inspect.

February 15 I visited the mine again and made an inspection. The entries had been driven the four points of the compass and a permanent system of ventilation had been adopted. The air will be divided into four currents, and each current will ventilate a separate part of the mine, which is the only practical way of ventilating large mines; and it is very pleasant for the Inspector to visit mines and find practical men in charge of same, who are giving the necessary attention to the sanitary condition of the mine and to the safety of the men under

their care. Good doors had been set at all the necessary places where a permanent door was needed. The coal is from 4 to 4½ feet in thickness and worked on the double-entry room and pillar plan, and 50 cents per ton is paid for mining unscreened coal. About 50 men were at work on date of this visit. The coal is shipped over the Hannibal & St. Joe R. R. to Kansas City, St. Joe, and points west and northwest.

Little Pittsburgh Coal Co., A. G. French, superintendent, H. Howe, foreman.— Mine located at Lingo, a mining camp situated 5 miles east of Bucklin, on main line of the Hannibal & St. Joe R. R. Shaft is 135 feet deep, using steam-power for hoisting. The ventilation is produced by a 12-foot fan. First inspection was made October 24, and the air was found stronger and fresher than on previous inspections. Two of the west entries had been abandoned, and the men put to work closer together on the first of the air. I visited the mine again on the 22d of February, but the men were on a strike. No inspection was made. March 15, I made another inspection of this mine, and found that all the work on the west side had been abandoned, as had also the north entry, and at the time, the work was all confined to the east side. Deficiency in the ventilation was found in the first east entry, owing to a fall of slate in the air-way, and men were at work cleaning the same, and making other connections to better the ventilation. The fan was making 74 revolutions per minute, and was passing 7615 cubic feet of air in same time, but the air-ways being very small, the air is greatly retarded on its travels. This mine is not classed amongst the well-ventilated mines. Coal about 4 feet thick and worked on the long-wall plan, paying for mining 74 cents in winter and 64 cents in summer. The mine is dry and very hot. The heat is caused from spontaneous combustion steadily going on in refuse of the mine. The mine has been in operation for a great number of years, and is not in good condition. About 100 men employed. The coal is shipped to points west and northwest.

MACON CITY POSTOFFICE.

Macon City is surrounded by coal mines, and considerable coal is taken out in the winter season to supply the home trade. The mines are working on a small scale through fall and winter only. The same seam of coal is worked at these mines as that at Ardmore and Bevier, and the mines are entered by drifts. The following are the names of the parties that are operating mines in the neighborhood of Macon City: W. J. Blansett, John Harold, Peter F. Rowland, E. Zollmann, Geo. F. Smith, Chas. Lawrence, Thos. P. Hunt, Wm. Tereche, Ed. Wenzel & Bro., and others. The capacity of some of these mines is very small, and their output is all consumed at Macon City and vicinity.

NEW CAMBRIA.

There is some mining done at New Cambria, but only on a small scale to supply the home trade. Wm. Howard, Joseph Yates and Thos. Gunter each operate a mine in this vicinity. The coal is about 20 inches thick, and of very good quality. The product is all consumed at home.

MONTGOMERY COUNTY.

Production, 12,175 tons.

Montgomery county has shown a small decrease in its output of coal during the past year as compared with the previous year. The report for that year showed the output to have been 15,923 tons, while the report of this year gives the product at 12,175 tons, showing a decrease of 3748 tons.

There is but one mine now in operation in this county, owned and operated by the Vandalia Coal Co. Mine located a half mile west of Wellsville, and connected with the Wabash R. R. Shaft 100 feet deep; equipped with good machinery for hoisting; ventilation is produced by an 8-foot fan, and the mine is well ventilated. The coal is about 30 inches in thickness, and is worked on the long-wall plan. It runs irregular and faulty in places, adding quite an expense to the cost of mining. The roof is good, requiring very little timber to keep same secure. The mine is dry, with good, high roadways, and in good condition. Ten railroad chutes have been erected for the purpose of supplying the engines of the Wabash R. R. Co. with coal, which consumes all the product of the mine. About 50 men and boys are employed.

A. Deholder, superintendent.

NODAWAY COUNTY.

Production, 2934 tons.

Mining is being prosecuted in the vicinity of Quitman and Burlington Junction, but only in a limited way to supply home trade. A seam of good coal was discovered in the western part of this county some years ago, and a large amount of coal has been taken out.

The coal varies in thickness from 12 to 15 inches, and is worked on the long-wall plan; paying \$2 per ton for mining.

QUITMAN POSTOFFICE.

Cordon Bird.—Mine located at Quitman. Shaft 50 feet deep; horse-power; from 4 to 6 men employed to supply home trade.

John Manargan.—Mine located east of Quitman. Slope opening, Coal 1 foot thick, and worked on the long-wall plan. Coal consumed at Quitman.

Nicholas Bros. operate a slope mine southeast of Quitman to supply local trade.

C. Peirson operates a mine near Quitman. Coal 14 inches thick, and worked on the long-wall plan. Coal consumed in the vicinity.

J. H. Howard.—Mine located at Burlington Junction. Shaft 35 feet deep; horse-power. Ventilation furnished by a furnace. Coal 30 inches thick, and worked on long-wall plan. Coal consumed in the surrounding country.

PETTIS COUNTY.

Production, 1738.

Coal mining in this county is confined to a number of small banks in the vicinity of Dunksburg, Green Ridge and Hughesville, which are operated to supply local trade during the winter.

DUNKSBURG POSTOFFICE.

Thos. Seran is working a mine on the Fisher land near Dunksburg. The coal is two feet thick and the mine is entered by a drift. The coal is worked on the room and pillar plan, paying 75 cents per ton for mining. Coal consumed at home.

HUGHESVILLE POSTOFFICE.

Alex. Carson operates a mine on George Griggs land, three miles west of Hughesville. Shaft 32 feet; steam-power used for hoisting. Coal 2 feet 6 inches in thickness, and is worked on the room and pillar method, and paying one dollar per ton for mining. Coal consumed in the immediate vicinity. There are other mines operating at Lamar and Dresden and near Sedalia, but only in a small way.

PUTNAM COUNTY.

Production, 119,832.

The decrease in the number of tons mined the past year amounts to 25,809, or 21 per cent compared with the previous year. This county is largely underlaid with an excellent seam of coal, and in the north-west part of the county, west of the Chariton river, two workable veins have been found. The prediction is ventured that not less than 30,000 acres of coal in this county is as yet untouched by the operator. However, during the past year, the attention of capitalists has been drawn to this fine coal field and mining in this locality may be expected on an extensive scale. It is our impression that Putnam county in a very few years will be in the front rank of our coal-producing counties. Following is a description of the principal mines.

BLACKBIRD POSTOFFICE.

Wm. Adkins operates a mine on the north side of Blackbird creek. Shaft 37 feet deep, hoisting done by horse-power. Mine operated on the room and pillar plan. From four to six men employed to supply home trade.

Blackbird Coal company.—Wm. Love, superintendent. Mine located at Blackbird, a mining camp three miles north of Unionville, and connected with the C., B. & K. C. railroad. Shaft 53 feet deep, and hoisting by steam-power. The mine is ventilated by a 12-foot fan, which was making 85 revolutions per minute and passing 9355 cubic feet of air around the workings in same time. This current was divided into two divisions, and each division was ventilating a separate part of the mine. The ventilation on the entries was found to be above the requirements of the law, but very weak in some of the rooms, owing to defective doors. Instructions were given to the superintendent to repair the same. About a year ago this plant burnt down, but was rebuilt at once, and in much better shape than before the fire. A fan was also erected in place of the furnace formerly used for ventilation. Coal 33 inches thick, separated into two layers by a clay band two inches thick below the center of the vein. The coal is underlaid by fire-clay mining, and overlaid by an excellent roof, well adapted for the long-wall method of mining; but the room and pillar plan is practiced here. The mine is making considerable water, but the roadways are in much better condition than on former inspection. Price paid for mining is a dollar per ton in winter, and 80 cents in summer for screened coal. About 40 men employed. The coal is shipped west and northwest, and is consumed in Missouri, Iowa and Nebraska.

Wm. Jump operated a mine near Blackbird to supply the home demand. The shaft is 27 feet deep, and the hoisting is done by horse-power. We have been informed that the mine has been sold to the Emporia Coal company.

Mendota Coal Co.—F. B. Ketchum, president, and B. H. Johnson, superintendent. This company owns and is operating three very large mines in this county, all of which are located at Mendota, in the northern part of the county, bordering on the Iowa line, and have shipping connections with the C. B. & K. C. R. R. The mines are all working the same vein of coal, which will average 33 inches in thickness, separated by a clay band two inches thick, running regular through the coal. It is underlaid by a fire-clay mining, and overlaid by a strong black slate next to the coal about a foot thick, and next to the slate lies the cap-rock, 4 feet in thickness, which renders this seam well adapted for

the long-wall or room and pillar methods of mining, both of which are used here, but the room and pillar method is preferred.

The mines are worked on the double-entry plan, and all the rooms are turned double and carried 40 feet wide, with a wheel-road on each side, with two men in a room. The coal is worked out by undermining, cutting the sides and wedging it down—what is called pick-work, and which is a very practical method of mining coal. Prices paid for mining, 88 cents per ton in winter and 70 cents in summer for unscreened coal. A practical miner can make very fair wages at these prices—in fact, it will take a practical miner to work in these mines, and my advice to the clod-hopper, as well as to the week-kneed miner, is to keep away from the mines of Putnam county. All the mines are safe, clean and well managed, and, with very few exceptions, well ventilated. Following is a description of each mine, as found at dates of inspection.

Mine No. 1 is a drift opening, and the coal is brought out by machinery, the tail-rope system being in use, and which extends a mile into the mine. This mine is worked in separate departments, known as the north and south parts. It is ventilated by separate furnaces in charge of different men, and might be termed two mines from same opening. First inspection of this mine was made July 28, 1893, and a deficiency in the ventilation was found in second east entry on north side. On calling the attention of Mr. Johnson to the deficiency, he said that the matter would be remedied at once; and within the next 30 days an air-shaft was sunk at the face of the workings, and was used as a downcast; thus the fresh air was carried direct to the men. Other parts of the mine were found in good condition. On second inspection a deficiency was found in the ventilation of the first east entry, owing mostly to defective doors. In fact, there was no air to be found at the face of this entry, and the attention of Mr. Johnson was called to the matter. By the action of the miners during the national strike, these mines laid idle for two months, and suffered considerable damage during that time, and on date of my second inspection the mines had only just started, and the company had men at work making the necessary repairs in order to put the mine in its former condition. Great improvement can be obtained in the ventilation of this part of the mine by the hanging of new doors, and by giving due attention to defective doors, which I feel confident will be done at once. Other parts of this section of the mine were found fairly vented; roadways dry and in very good condition.

J. Ward, foreman.

The south part of the mine was inspected at same dates as the north part, and the ventilation found up to the requirements of the law on

both inspections. Air-courses had been cleaned since the strike, nearly all the doors had been repaired, and the air-current was circulating around the face of the workings in sufficient quantities to sweep away the black damp that accumulates so quick and thick in this mine. Roadways dry, and mine in good condition.

E. C. Smith, foreman.

Mine No. 2, Martin Coleman, foreman.—This is a shaft 63 feet deep, equipped with good hoisting machinery. The engines were built by the Ottumwa Iron Works, and are 10 and 14 inches in cylinders, connected direct to a 5 foot drum. The engine-house, boiler-room and top-buildings are well constructed and very convenient for the handling of coal. An air-shaft is sunk, and the mine at present is ventilated by a furnace, but preparations were being made at date of my last inspection to erect a fan to take the place of the furnace.

This is a new mine, having been in operation about a year; therefore, the under-ground workings are not very extensive, but it has been opened up in a very practical way and has a large output for a new mine. In the very near future this will be one of the largest producers in the State.

The air volume is split at the downcast, part going to the west side and the other part going around the workings on the east side, uniting again at the furnace. A very strong current of air was found traveling, which was well conducted around the workings, but the proper attention was not given to all the doors, as several leakages in some were found in first north entry on the east side; instructions were given to have all doors made air-tight.

The longwall and room and pillar methods are both used here, but the proper care and attention is not given to the long-wall plan, and under the circumstances will prove a failure unless more practically worked. It seems to me that the long-wall plan is yet in its experimental stage in this section, and further education is necessary for the success of this plan. All the roadways are high and dry, and the mine is in good condition. About 150 men employed.

Mine No. 4.—Ed McCullom, foreman. This is a drift opening, with an elevated track sufficiently above the railroad track to permit of dumping. The coal is brought out to the surface by machinery. Ventilation is produced by a furnace, which is the best-constructed furnace in the State. The upcast is a circular shaft, 8 feet in diameter and 80 feet deep, built with brick from top to bottom. The furnace is also built of fire-brick, 6 feet wide by 6 feet long, and about 4 feet high above the bars; a man is constantly employed to attend to the fire. Two inspections have been made of this mine during the past year.

First inspection was made July 27, 1893, and a deficiency in the ventilation was found in the 4th and 5th north entries, owing mostly to falls on the airways. When the attention of Mr. Johnson was called to the deficiency he remedied the matter at once by removing the pit boss, and put a more competent man in charge. On second inspection, I found the airways had been cleaned and enlarged, and a large volume of air flowing through the mine in two currents, one current ventilating the south part, while the other ventilated the north part, and meeting at the upcast. A very much improved system of ventilation is practiced at the mines of this company by driving headers in advance of the workings, thus shortening the route of the current, as well as causing the air to travel through the fresh work, giving fresher air to the men to breathe. Roadways good, mine dry and in good condition, with about 90 men employed. The product of these mines is shipped north and northwest, and is consumed in Missouri, Iowa and Nebraska.

UNIONVILLE POSTOFFICE.

There are no mines in the immediate vicinity of Unionville, but several parties are operating mines on a small scale southeast. The coal is hauled in wagons to supply the home demand; the names of these parties, with the output of their mines, will be found in the statistical tables.

Emporia Coal Co.—This company bought upward of 5000 acres of coal land in this county, sunk a trial-shaft one mile north of Unionville, striking a good seam of coal, and is now making preparations to sink a shaft and open up an extensive mine.

RALLS COUNTY.

Production, — — tons.

PERRY POSTOFFICE.

Standard Coal Co.—Mine located at Perry; shaft 40 feet deep; horse-power. This mine was formerly operated by the Vandalia Coal Company, but was sold to the present owners in January, 1894; the coal is about 24 inches thick, and is worked on the long-wall plan; it is underlaid by a soft fire-clay, and is very easily mined; the roof that overlies the coal is of the nature of black slate, soft and friable, but it seems to stand better under the long-wall than the pillar and room system of mining; the coal is of very fine quality, and commands a high price in the coal market; it is shipped and consumed at Hannibal, Perry and vicinity.

RANDOLPH COUNTY.

Production, 209,656 tons.

This county, like all of the other counties producing much coal, shows a decrease in its production for the past year. The decrease, however, is much less in proportion than that of any other county, being only 10,106 tons, or $4\frac{1}{2}\%$; when this is compared with the average decrease of the State, amounting to $25\frac{1}{2}\%$, the showing becomes satisfactory by comparison. For statistical details see table No. 6, and for a description of the mines and their condition see remarks following this:

ELLIOTT POSTOFFICE.

Fleming Coal Co., W. H. Jones, superintendent; James Davies, foreman.—Mine located at Elliott, a mining camp, situated 5 miles south of Moberly and connected with the M., K. & T. R. R. Shaft 145 feet deep, and equipped with very fair machinery for hoisting. The mine is ventilated by the Murty or Champion double fan, which is the only fan of this kind in the State. The Champion fan differs from others in several respects. It is really a double fan, working on one shaft. The blades are curved, running into the circumference. It is convertible from an exhauster to a blower, or *vice versa*, without stopping or changing the motion of the fan. This is done by changing the positions of the doors of the casing of the fan. The apparatus is set immediately over the shaft and is driven by the aid of a belt.

A careful inspection was made September 2, 1893, and all the work at this date was confined to the south side, which was found in good condition, with the ventilation up to the demands of the law.

January 22, I made another inspection of this mine, and found considerable work had been opened up on the south side since my former visit. The air is conducted around the mine in one undivided current, which system is not very practical in the ventilation of extensive mines. While the air-current was found up to the requirements of the law in all parts of the mine, yet it was very impure in some portions, having been so vitiated with black damp on its long route as to be unfit to breathe. There were about 120 men working in the one current on date of this visit.

During the years 1891 and 1892, this mine remained idle and suffered considerable damage during that time, and the company has been under a great disadvantage in reopening the mine under the existing circumstances.

I again visited the mine in March, and found it in good condition, with preparation being made to split the air into two currents.

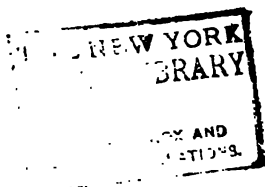
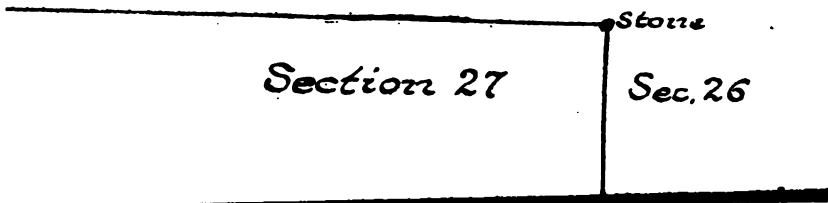
Embodied in this report will be found an accurate map of the Elliott mine. The coal will average about 44 inches, and is worked on the long-wall plan. It is overlaid with a soapstone roof of a very friable nature, requiring considerable timber to keep it secure. Price paid for mining is 80 cents per ton for clean coal the year round. From 125 to 150 men are employed, and the product of the mine is consumed by the railroad company.

HIGBEE POSTOFFICE.

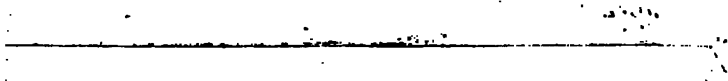
Higbee Coal and Mining Co., Wm. Walton, superintendent, Hiram Hyde, foreman.—Mine located west of Higbee and connected with the C. & A. R. R. Shaft 170 feet deep and equipped with first-class machinery for hoisting.

On first inspection, we found the north side of the shaft had been temporarily abandoned owing to the depression in the coal trade, and all the work was confined to the south side. The mine is ventilated by a 10-foot fan, and the air volume is divided into the east and west entries, passing to the west side over an air-crossing, and the currents meet again at face of south entry and return to the upcast. The west side was taking more air than the east owing to obstruction in the airways, which evil was at once removed by having same cleaned. Measurements of the air were taken at different places, and the ventilative current was found above the requirements of the law at each place.

Second inspection was made soon after the national strike amongst the miners, which caused this mine to lie idle for over two months, and it was a great sufferer during that time; a considerable squeeze had occurred over a large portion of the mine, and some parts had to be abandoned, which very much disarranged the ventilation, but a force of men were at work cleaning and timbering, in the effort to put it in its former good condition. All the air-courses had been cleaned and timbered since my last inspection, and a good current of air was circulating around all the work that was open. Considerable of the shaft-curbing had been retimbered, and two new cages had been put in during the past year. The coal is from $3\frac{1}{2}$ to 4 feet in thickness; worked on the long-wall plan; mining is paid for at the rate of 80 cents per ton for clean coal; about 80 men are employed; the roof overlying the coal varies in the character of its formation from that of shale to sandstone and soapstone; it is of a friable nature, requires great care and expense in properly timbering and keeping same secure; roadways high and dry, and mine in good condition; the coal is shipped to points west, but the C. & A. R. R. Co. consumes a large amount of the out-



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put. There are 10 chutes erected at the mine with which to coal engines, and from 60 to 75 tons per day are consumed in this way.

Interstate Coal Co.—John S. Elliott, president, and Wm. Walton, superintendent. Mine located one and one-half miles south of Higbee, and connected with the M., K. & T. R. R. Shaft 110 feet deep; equipped with first-class machinery for hoisting. The mine is ventilated by a 12-foot ventilating fan, and a large current of air was found circulating around the workings at date of inspection, January 29. The mine closed down in June, 1892, owing to loss of contract to supply the railroad company with coal, and remained closed until December, 1893, when it was cleaned up and started again with 55 men employed on the east side at date of my visit. The mine was opened up very extensively, and was practically operated, and, had it continued operations, would have proved the largest producer in the State; for, in fact, it may be said that the mine was only fairly opened when the work was suspended, and with its large body of coal in such close proximity to the shaft bottom, from all directions, makes the opportunity for readily handling the same exceedingly easy and economical. The coal is $3\frac{1}{2}$ feet thick, and worked on the long-wall plan. The rate of pay for mining has been 80 cents per ton for clean coal. Its roadways are high and dry, and all parts of the mine that have been worked are in excellent condition. The product of the mine is carried to market over the M., K. & T. R. R., and is consumed at local points along the line of the same. Thomas Bain, mine foreman.

HUNTSVILLE POSTOFFICE.

John Breckenridge owns and is operating two mines near Huntsville, both of which have shipping connection with the Wabash railroad. Both mines are working the same seam of coal, which will average about four feet in thickness, and are operated on the room and pillar plan; both are shaft openings, and steam power is used for hoisting.

Mine No. 1 $\frac{1}{2}$.—John Breckenridge, manager, and John Jacks, superintendent. Mine located two miles east of Huntsville. Shaft 98 feet deep, and ventilated by a 10-foot fan. A careful inspection of this mine was made September 22, and a deficiency was found at this date in the third west entry. The airways on the east side of the mine had been cleaned, enlarged and timbered, and men were at work cleaning and enlarging the airways on the west side, which would add greatly to the ventilative current. January 24 I made another inspection of this mine, and found 11,840 feet of air passing per minute, with about 80 men at work. The air was divided into two currents at the bottom

of the downcast, part going to the east and part to the west side, meeting at the face of the south entry, where it would return to the fan shaft. On this plan, the air had to travel a long distance through old workings, and coming in contact with the decay of material, which is constantly going on, thus vitiating the same to such an extent as to make it very impure before it reached the miners. And to remedy this evil, an overcast was erected on the south entry, and now the air travels the entry direct from the downcast to the face, where it is split, thus giving the miners the benefit of the air direct, and which has also added a large amount to the volume, as well as to the purity of the air. The coal is overlaid by a soapstone roof, and requires considerable timber to keep secure. Roadways and mine dry, and in very good condition.

Mine No. 3½ is located at Huntsville. Shaft 65 feet deep. Ventilation is furnished by a 12-foot fan, and the mine is fairly ventilated.

On first inspection, which was made on the 20th of September, I found a deficiency of air in the second west, entry owing to defective doors and obstructions in the cross-cuts. Instructions were given to the superintendent to have these evils remedied at once. In three days I went back to the mine and found that my instructions had been complied with, and a good current of air was found circulating around the work.

On the 1st of October, 1893, the miners struck in sympathy with the Kansas miners, and this mine suffered considerable damage, which had not been fully recovered at date of later inspection made December 13; as I found the ventilation was very weak in some parts of the mine, and the doors were also defective. On the next day after this visit, the mine closed down, owing to the depression in the coal trade, and remained idle up to the close of the fiscal year. An overcast was also erected at this mine during the past year, which added largely to the air-current. The price paid for mining is 50 cents per ton for un-screened coal. The product of the mines is carried to market over the Wabash railroad, and is consumed at points west and northwest.

Caffery & Baker Coal Company.—Mike McHugh, superintendent. This company is operating 3 mines here, all of which are located about half mile southwest of Huntsville. The mines are situated about three-fourths of a mile north of the Wabash railroad, and a switch has been constructed from the main line to the mines, a switch engine being used to haul the coal.

Mine No. 20.—George Evans, foreman; this is a drift, and ventilation is furnished by a furnace, which was giving good results at each inspection. The mine was opened up very extensively, but, unfortun-

nately, a fault was struck in the south entry, cutting the coal out entirely, which retarded the progress of the mine very much; the third and fourth west entries were driven through the west end of the fault, and struck good coal, and on our last visit to the mine the company had men at work driving through the fault in the south entry, as the coal had been tested good on the other side; coal will average four feet in thickness, and is worked on room and pillar plan; mining paid for at rate of 50 cents per ton for unscreened coal; roadways high and dry, and mine in very fair condition; about 80 men employed.

Mine No. 25.—Jonathan Lewis, foreman. This is also a drift opening, located about a quarter of a mile north of No. 20; this is a new mine, opened up in the summer of 1893; it is ventilated by a furnace, which was giving very fair results on each inspection; the coal is very irregular and faulty at this mine, and runs into low coal; it is worked on the room and pillar plan, and 50 cents per ton paid for mining run of mine; it is fairly drained, and has very good roadways.

Mine No. 30.—This is another new mine, opened up during the summer of 1893; it is a drift, and ventilated by a furnace; the coal at this mine is of the same thickness and worked on the same system as that at the other mines, and paying the same for mining; the coal here is very soft, owing to the shallow covering overlying same; the product of these mines is taken to market over the Wabash R. R., to points west and northwest.

Lamb & Bailey.—Mine located at Hamilton; drift opening; operating in fall and winter to supply local trade, although some coal is hauled in wagons, loaded on cars and shipped over the Wabash railroad to market. The same coal and system is used here as that of other mines in this vicinity.

Mitchell & Sanchison.—Operate a mine north of the court-house. Drift opening, and ventilated by a furnace; coal 4 feet thick, and worked on the room and pillar plan. The mine is operated to supply local trade, but a very large amount of it is hauled in wagons and loaded on cars at the depot switch, and shipped over the Wabash railroad to market. Mine gives employment to about 12 men.

Stewart & Robinson.—Mine located at Huntsville; drift opening, and ventilated by a small furnace; operated in fall and winter to supply home demand.

Mike Strieff.—Drift opening; mine located at Huntsville; coal about 4 feet thick and worked on the room and pillar plan; mine only operated in fall and winter to supply the home trade.

Emanuel Edwards.—Drift opening; mine located north of Huntsville; coal 4 feet thick; room and pillar plan; supplying home trade.

MOBERLY POSTOFFICE.

Eagle Coal Co., H. R. Bisbee, superintendent.—Mine located two miles west of Moberly. Shaft 125 feet deep, equipped with steam-power for hoisting. This is a new mine opened up in the summer of 1893. A trial shaft was first put down and a 4-foot vein of coal struck at the above named depth; and a larger shaft was sunk about 200 feet west of the trial hole, when it unfortunately missed the coal altogether, and several yards of entry had to be driven through slate and rocks before the coal was found, and when found it proved to be very irregular and faulty, and at date of this writing the mine is closed.

Moberly Mutual Coal Co., P. J. Perkins, manager.—Mine located two miles northwest of Moberly. Shaft 105 feet deep; horse-power used for hoisting. Mine ventilated by small furnace which was giving very fair results on dates of inspection. Coal 4 feet thick and worked on the room and pillar plan. All the coal is hauled from the mine in wagons and is consumed at Moberly and vicinity. From 8 to 12 men employed here.

Harry Ward. — Mine located two miles west of Moberly. Shaft 85 feet deep; horse-power. Coal 4 feet thick, worked on the room and pillar plan. Ventilated by a small furnace. From 4 to 8 men employed. Coal consumed in the vicinity of Moberly.

J. B. Williams & Son.—Mine located 1½ miles northwest of Moberly. Shaft 90 feet deep; horse-power. Ventilated by a small furnace. Cages and ropes were condemned, and immediately replaced by new ones. Coal 4 feet thick; worked on room and pillar plan, and employing few men in fall and winter to supply local trade.

Following is a list of parties operating drift mines in the hollow below the Williams mine, all of them operating the same vein of coal as that so extensively worked throughout the county, and upon the same system. The product of the mines is hauled in wagons and consumed at Moberly:

Jacob Haver, Wm. Brennan, W. K. Roebuck, W. E. Miller, John Schnider, Wm. Vaughn, Jim Hedrick, Wm. Chase, Wm. McClernand and Wm. Radrick. The output of these small mines will be found in the statistics in table of this county.

RENICK POSTOFFICE.

Forest & Genola.—Mine located at Renick. Shaft 65 feet deep; horse-power. In the summer of 1893, the Renick Coal Co. abandoned *this shaft*, took down the pit-head and removed the machinery to *one county*. In the fall of same year, Forest & Genola erected a

new pit-head and built a horse-power apparatus and operated the mine, working the small vein, which is 20 feet above the bottom seam. This coal is of a superior quality to that of the lower seam, and commands a higher price in market. This seam is about 20 inches thick, and is worked on the room and pillar plan. Considerable coal has been taken out during the winter and shipped over the Wabash R. R.

Brooks & Martin operate a mine between Renick and Clark stations to supply home trade. There are several other local mines, located southeast of Renick, operating on a small scale in the fall and winter.

There are several small mines in this county, located at Jacksonville, Rolling Home, Thomas Hill, near the north county line, and near Yates, Armstrong and Roanoke, on the south and west lines. The names of parties operating these mines, and their output, will be found in table of this county. The mines are only operated during winter months, and their product is consumed in their immediate vicinities.

RAY COUNTY.

Production, 196,852 tons.

The decrease of production in this county amounts to 122,553 tons or 38 per cent, compared with the output for the year ending June 30, 1893. For other details see table under head of Ray county.

Following is a description of the mines :

CAMDEN POSTOFFICE.

Bovard & Brown Coal Co., B. Lusk, manager.—Mine located two miles east of Camden, and connected by a switch with the Santa Fe railroad. Shaft 43 feet deep ; steam-power used for hoisting. The plant was burned down the latter part of November, 1893, and the company was rebuilding at date of my first visit, December 13. On second visit, April 12, the plant had been rebuilt and a pair of engines had been put in place of the upright engine that was in use before the fire ; new ropes had been put on, a new pit-head and engine-house built, and the plant is in much better condition than on any former visit ; but, as the mine was not running, no inspection was made of the inside workings.

FLEMING POSTOFFICE.

Kansas & Texas Coal Co., B. F. Hobart, president, and Ed. Vale, superintendent.—Mine located at Fleming, and connected with the Wabash railroad ; shaft 70 feet deep ; equipped with very good machinery for hoisting ; ventilation is produced by a 12-foot fan, *giving satisfaction*. I made a careful examination of this mine

ber 13, 1893, and found the air coming down the hoisting-shaft, traveling over north entry to face of workings, where it divides, part going east and part to the west entries, thence returning to the upcast through the face of the work. The shaft is located on the north side of the Missouri river, and all the workings are confined to the north side of the shaft. Second inspection was made April 12, and the ventilation was found unequally divided, the west side getting more than its share, owing to obstruction on the east side.

The coal is about 18 inches thick, and like all other mines in the county, is worked on the long-wall plan. A layer of slate comes down with the coal, which is used to build pack-walls to secure the roof, as very few props or timber of any kind is used. The roadways are high, dry, and the mine kept in good condition. Ninety-five men and boys employed at first inspection, and 60 on second inspection. There are ten coal-chutes at the mine, with which to coal the trains of the Wabash R. R. Co. From 50 to 60 tons per day are consumed in this way, and the balance of the product is consumed west and northwest.

GEORGEVILLE POSTOFFICE.

W. Sater operates a mine at Georgeville. Shaft 155 feet deep; horse-power. This is the same seam of coal as that so extensively mined at Richmond, but the coal is not quite so thick. The mine is operated in the fall and winter to supply the home demand, employing from 4 to 6 men. Coal 22 inches thick and worked on the long-wall plan.

ORRICK POSTOFFICE.

Bissell Coal Company.—John Bissell, superintendent; mine located at Albany, one mile north of Orrick; shaft 64 feet deep, with steam-power in use for hoisting. First inspection of this mine was made September 4, 1893, and the ventilation found rather weak, but the escape-shaft, that I ordered sunk on a former visit, was nearly down, and when completed the ventilation will be greatly improved. December 12, I visited the mine again, found the escape-shaft completed and the ventilation very much better than on former visits. Third inspection was made April 13, when the air was found in sufficient quantity, and the cages, ropes and safety appliances in good order. The coal seam is the same as that which is worked in other sections of the county; it runs from 18 to 20 inches in thickness, and worked on the long-wall plan; the coal is hauled in small cars for a mile, and dumped on railroad cars at Orrick, from which place it is shipped to Kansas City and points west, over the Wabash R. R.; from 20 to 30 men employed.

RICHMOND POSTOFFICE.

Black Diamond Company.—Wm. Pence, superintendent; mine located at Richmond; shaft 83 feet deep; horse-power; ventilation is furnished by the aid of a stove, which was sufficient for the capacity of the mine. The mine is only operated in fall and winter to supply local demand, although some coal is hauled in wagons, and shipped; coal 23 inches thick, and worked on long-wall plan, giving employment to 8 or 10 men.

Old Black Diamond mine is located at Richmond, near the new Black Diamond, and has an underground connection with same. Shaft 80 feet deep; horse-power. Mine operated in fall and winter to supply the home demand.

Darneal Coal company.—John Hubbell, manager, and John McCart, superintendent. Mine is located one mile west of Richmond, and known as Mine No. 10. Shaft 110 feet deep; horse-power. Ventilation is produced by a furnace. First inspection was made September 7, 1893, and the mine found in very good condition; roadways high and dry, and the ventilation up to the requirements of the law. Second inspection was made the 7th of March, 1894, when the mine was again found in good condition. On this visit, the attention of Mr. McCart was called to the safety-catches, which were not in good order. An underground connection is kept open between this mine, and No. 11, as an avenue of escape in case of accident. Coal 22 inches thick, and worked on the long-wall plan; from 40 to 50 men employed. Coal consumed at St. Joe and points west.

Douglas & Hastings.—Mine located at Richmond. This is a new mine; shaft sunk in the summer of 1893, coal being found at a depth of 80 feet; horse-power is used for hoisting; from 4 to 8 men employed in fall and winter to supply the home demand.

Mine No. 8 is located west of Richmond, and is connected with the St. Joe branch of the Santa Fe railroad. Shaft 110 feet deep; steam plant; ventilation is produced by a furnace, which was found deficient on date of first inspection, September 7, 1893, owing to obstruction in the airways. One of the safety-catches was also found in poor condition. Instructions were given to the mine foreman to remedy these deficiencies at once. This mine was formerly operated by the Hubbell Mining Co., but in August, 1893, went into the hands of a receiver. On my second visit the mine was not running, and no inspection made. The coal at this mine, like that of the surrounding mines, is 24 inches thick, and worked on the long-wall plan, employing from 15 to 20 men. Coal consumed west and north.

Hubbell, Hyat & Hubbell Coal Co., John Hubbell, manager; John McCart, superintendent.—Mine located within the limits of the city of Richmond, and connected with the St. Joe branch of the Santa Fe R. R.

Shaft 115 feet, steam-power, and ventilated by a furnace, which was giving poor results at date of inspection, September 8, 1893. The mine has been and is very extensively worked, and the air has a long distance to travel through the face of old workings; and as the coal is worked on the long-wall method, the roof is necessarily settling and lessening the area of the air-course, which is one of the greatest difficulties met with in retarding mine ventilation. The furnace is inadequate to produce that quantity of air in the mine required by law, and Mr. McCart was notified that it must be enlarged, or a fan substituted.

During the summer, when there is no demand for coal, this mine is usually closed down for a few months, which causes more or less damage, as no repairs are made when the mine is idle. On the whole, there is too much economy practiced here to keep the mine in a good sanitary condition. The air passes down the main shaft and travels to face of work, where it is split to the right and left entries; thence returning to the upcast through the face of the workings. An underground connection has been made between this mine and mine No. 8, for an avenue of escape for the men in case of fire or accident of any kind in either of the mines; it is always kept in good condition.

March 10, another visit was made, but as the mine was closed down for the summer no inspection could be made. Coal 24 inches thick and worked on the long-wall plan; about 70 men are employed. Coal consumed at Kansas City and St. Joe, and points west and north-west.

Murray & James.—Mine located two miles southeast of Richmond. Shaft 60 feet deep; horse-power; mine only operated in fall and winter to supply the local demand. The coal is 24 inches thick, and is the same seam as that so extensively worked throughout the county.

Ben Conroy operates a mine north of Richmond to supply home trade.

Pickering Coal Company.—Mine located one mile northwest of Richmond, and connected with the St. Joe branch of the Santa Fe railroad. Shaft 110 feet deep; equipped with very fair machinery for hoisting; ventilation produced by a furnace located near the bottom of hoisting shaft, and exhausting through an air chamber, partitioned off from the side of main shaft; it was giving good results at dates of inspections, September 8, 1893, and March 7, 1894. The air current is *conducted around* the face of the workings in two volumes; passing in

at the east side, it is then divided to the north and south, meeting again at face of west entry, from which point it returns to the upcast. The airways are high and wide, giving free access to the air; this largely assists in making it the best ventilated mine in the county.

Coal 24 inches in thickness, and worked on the long-wall plan; mine dry, with good high roadways, and in good condition. A connection is made between this mine and the Darneal Coal company's mine, for escapement for the men in case of accident, and is kept in good condition. From 40 to 50 men employed. The coal is consumed at St. Joe and points west. Wm. Main, foreman.

Rooney Bros. are operating the mine formerly operated by W. Douglas, which is located 1 mile from Richmond. The shaft is 60 feet deep; horse-power. Coal seam is the same as that worked in other sections of the county, and worked on same plan; from 4 to 6 men employed to supply local demand.

Sandy Rankin.—Mine located 1 mile northwest of R. & L. Junction, and connected with the St. Joe branch of the Santa Fe R. R. Drift opening, and ventilated by a furnace, giving very good results. This mine has been in operation over 18 years, and is worked very extensively. There is considerable water in the mine, but it is readily handled by a powerful pump. Roadways high, but wet in places, otherwise the mine is in good condition. Coal and mode of mining the same here as in other parts of the country. From 30 to 40 men employed. The product is consumed at points west and northwest.

Richmond Coal Co., J. S. Hughes, president; John Gibson, manager; Sandy Gibson, superintendent.—This company owns and is operating 7 mines in this county, which are great factors in the coal production of the State, exceeded only by two companies during the year 1893. Two of the mines are located 1 mile west of Camden, and are connected with both the Wabash and Santa Fe railroads; the five other mines are located near Richmond, and connected with the St. Joe branch of the Santa Fe R. R.

All of the mines are worked on the long-wall plan, as with the clay-mining and a strong rock roof, the general surroundings are well adapted to this method; in fact, this is the only practical and profitable method of working thin seams of coal.

The thickness of the coal at the Camden mines is about 18 inches. It is overlaid with 10 inches of draw slate, which comes down with the coal, and is used to build walls to secure the roof, as very little timber is used in these mines. The coal in the vicinity of Richmond will average about 24 inches in thickness, and is overlaid with an excellent rock roof. A movable face-track is used at all the mines in this county,

which is a great convenience to the miner in loading his coal, as it saves the extra labor of re-handling it. The mines of this company are all well ventilated and drained, with good, high roadways, and in very good condition generally.

Following is a description of each mine, with a statement as to the general condition and location as found at dates of inspection :

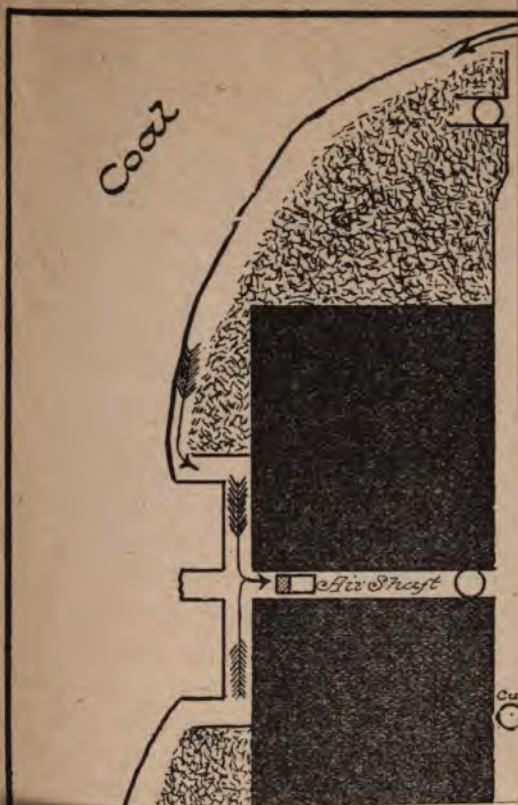
Mines Nos. 1 and 2 are located one mile west of Camden, and each connected with the Wabash and Santa Fe railroads. Both shafts are equipped with good machinery for hoisting.

All the safety appliances, ropes, gates, cages and safety-catches were found in good repair. An underground traveling way connects the two mines, so that either one may act as escapement to the other in case of accident. Both mines are working the same face of coal, and might be termed one mine with two openings. Both mines are ventilated by a furnace located at Mine No. 2; the air passes down the hoisting shafts, and travels north to the face of work No. 1; here it splits to the east and west, the part going east returning to the upcast, and the part going west traveling through the face of the workings, uniting with the air from No. 2 at the second west entry, and returns to the upcast. The ventilation was very good at dates of inspection, December 13 and April 13. The furnace is inadequate to meet the demands made by the law in all parts of the mine, and the company contemplates sinking another shaft 1500 feet west of Mine No. 2, moving the machinery from No. 2 to No. 3, and erecting a 12-foot fan at No. 2 to ventilate both mines. There is no doubt that these changes would have been made in the summer of 1893, but for the depression in the coal trade and the stringency in money matters.

Coal 18 inches thick and worked on the long-wall method. A layer of draw slate comes down with the coal and is used to build pack-walls, to secure the roof. The roadways are high, wide, dry, and in very good condition. About 125 men employed at both mines.

Ten coal chutes have been erected at Mine No. 1 to coal the trains of the Santa Fe Railroad Company. A large amount of the product is consumed in this way, and the balance is shipped to Kansas City and points west.

Mines Nos. 3, 4 and 5 are located $1\frac{1}{2}$ mile south of Richmond, and connected with St. Joe branch of the Santa Fe railroad. These three mines are connected by an underground roadway, and are all working on the same coal face, which is one mile and a quarter long, and all three are ventilated by the same fan, which is set on top of an air-shaft near mine No. 5; and for all practical purposes the three may be called one mine with three openings.



in fall and winter, employing about 25 men.
 No. 12 located $1\frac{1}{2}$ mile west of Richmond, and connected
 St. Joe branch of the Santa Fe railroad. The shaft was sunk
 and coal found at a depth of 125 feet. The company have

Mine No. 3 is a shaft, 55 feet deep; equipped with very good machinery for hoisting and draining. First inspection was made September 8, when the ventilation was found up to the requirements of the law, with a very strong current of air passing through the face of the workings. This is considered a wet mine, as considerable water accumulates at the face of workings, which is drained out by a pump. Mines Nos. 4 and 5 only were working at date of this inspection.

Second inspection was made March 9. At this date only one mine (No. 3) was running, which rendered any test of the sanitary condition of the mines unsatisfactory, as only one-third of the usual number of miners were at work, to make use of the air considered efficient for the three mines. A careful examination was made of all parts of the mine, and the roadway between No. 3 and No. 4 was found in good condition, with the machinery, ropes, cages and safety-catches in very fair condition.

Mine No. 4 is located about one-fourth of a mile north of Mine No. 3. Shaft 70 feet deep; steam-power is used for hoisting. This mine has an underground connection with mines Nos. 3 and 5, and is working the same coal-face and ventilated by the same air-current. The ventilation was found satisfactory at both dates of inspection, and all other requirements of the law complied with. The roadways are high, dry and good, and the mine considered in good condition.

Mine No. 5 is also a steam plant, located one-fourth of a mile north of Mine No. 4. Shaft 75 feet deep. The same description of the underground workings applies here as that given for Nos. 3 and 4. The fan is 12 feet in diameter; it is set near this plant, and was making about 120 revolutions per minute, on date of my visit. The air-current is divided into two parts, one of which passes to the west, and the other to the east workings, and after traversing the entire working-face of the mine, it is forced out at the hoisting shafts. Good roadways are maintained between the mines, to afford an avenue of escape in either in case of accident. The roadways are high and dry, and the machinery, gates, cages and ropes in good repair.

Mine No. 9 is located one-half mile west of Richmond, and connected with the St. Joe branch of the Santa Fe railroad. Shaft 100 feet deep, and the only mine operated by this company where hoisting is done by horse-power; ventilation is produced by a furnace which is giving very good results at date of inspection. The mine is only operated in fall and winter, employing about 25 men.

Mine No. 12 located $1\frac{1}{2}$ mile west of Richmond, and connected with the St. Joe branch of the Santa Fe railroad. The shaft was sunk in summer and coal found at a depth of 125 feet. The company have

erected a brick engine house, and equipped the mine with first-class machinery. The pit-head and tipple house is well constructed for convenience and economy. Every effort was made, neither money or labor spared to make this the best mine in the county. But unfortunately the shaft was sunk in a faulty place, where the coal was found very low and running irregular. Entries have been driven in all directions to test the coal with very poor satisfaction up to date of my visit March 9. I hope, however, that the thickness of the coal will soon come up to the standard, as this company deserves success for the enterprise it has displayed, and the large amount of money which it has expended in order to make it a first-class mine.

All coal from the mines of this company is consumed in Missouri, Kansas, Nebraska and Minnesota. For a number of years \$1 per ton has been paid for mining in this county, both summer and winter; but on March 1, 1894, the price of mining was reduced to 87½ cents per ton—the lowest ever paid for mining in this section. The company employs about 400 men and boys.

SWANWICK POSTOFFICE.

Williams Coal Co., J. R. Williams, superintendent; F. M. Lamb, foreman.—Mine located at Swanwick, a station 5 miles north of Richmond, on the St. Joe branch of the Santa Fe railroad. Shaft 95 feet deep; horse-power. This is the same seam of coal as that so extensively mined in other parts of the county; but it is much more obstructed by faults, and runs more irregular. Ventilation is produced by a furnace located near bottom of hoisting-shaft, and exhausting through an air-chamber partitioned off from side of main shaft. It was giving very fair results, and the mine found in very fair condition; but the cages and safety-catches needed repairs, and the attention of the foreman was called to the matter. Two new hoisting-ropes had been put in the place of the old ropes which were condemned on former visit. Mine employs about 25 men, and the product is consumed at local towns along the line of railroad.

ST. CLAIR COUNTY.

Production, 5337 tons.

While the greatest portion of St. Clair county is underlain by the Coal Measure formation, yet very little mining is carried on in the county. The mines that have been operated during the past year are worked on a small scale to supply home consumption. The following parties have been operating mines, in various parts of the county, during the past year:

J. W. Alexander is stripping coal near Appleton City, where it is consumed.

Bachelor Bros. are operating a strip-mine in the same locality, to supply home trade.

Ed. McDaniel is operating a strip-pit on the Donahue land, near Appleton City.

Jas. Allison is operating a strip-pit near Johnson City, to supply home demand.

L. G. Oherington operates strip-mines at Lowry City.

R. L. Crawford is operating strip-mine at Lowry City, to supply home demand.

Walker Bros. are stripping coal on Chris. Claus' land, and shipping over the Bailey road.

C. W. Nesbit operates a drift and a strip-pit, to supply the home market at Lowry City.

Wm. Dowers is stripping coal at Lowry City.

Dr. Bell operates a drift-mine, near Osceola, to supply home trade.

Wm. Watkins operates a mine four miles northwest of Osceola; slope opening; coal 30 inches thick, and worked on the room and pillar plan, and hauled in wagons to Osceola, where it is consumed.

M. D. Gibson operates a mine on the Harry Lewis farm. Slope opening. Coal 30 inches thick, and worked on the room and pillar method. The coal is hauled in wagons to Osceola, where it is consumed.

W. A. Seymour is operating a mine four miles northwest of Osceola, known as the Hoover bank. Coal 30 inches thick, and worked on the room and pillar plan, and consumed at Osceola.

VISTA POSTOFFICE.

Douthat & Vannice.—Mine located at Vista and connected with the K. C., Ft. S. & M. railroad. Shaft 55 feet deep; hoisting by horse. Formerly, all the coal mined at Vista was found in the hills and taken out through drifts and slopes, but this company sunk a shaft last fall and struck a three-foot vein of coal at the above-named depth. It is worked on the room and pillar plan, and 75 cents per ton is paid for mining clean coal. An air-shaft has been sunk, and the mine will be ventilated by a furnace. About 10 men are employed. The coal is consumed at Springfield, Clinton and other points along the line of the road.

SULLIVAN COUNTY.

MILAN POSTOFFICE.

Locust Valley Coal Co.—Mine located at Milan, and connected with the C. B. & K. C. R. R. Shaft 190 feet deep; equipped with first-class machinery for hoisting. The shaft is sunk between two railroads and is surrounded by every convenience. The machinery, ropes, cages, gates and safety-catches were found in good working order. First inspection of the mine was made December 6th, and 15 men were at work at this date, in the northwest entry, which entry was closed on my former visit, and all the work confined to that part of the mine. The roof was found stronger and harder and easier to secure than on the first opening up of the mine; the rock that was encountered near the bottom of the coal had become thicker as the work traveled westward. Having previously notified this company to sink an escapement-shaft, and finding on this visit that nothing had been done toward the commencement of work on same, the following letter was sent to the company:

JEFFERSON CITY, Mo., January 2, 1894.

Locust Valley Coal Co., Milan, Mo.:

GENTLEMEN—My predecessor insisted on your sinking an escapement-shaft at your mine, and I have done the same, but so far without avail. While I appreciate the generally depressed condition of business as atoning in a measure for your failure to obey our instructions, and personally would like to aid you in holding off until money matters become easier, yet you must know that I am dealing with the conditions that exist in the mine, and have nothing to do with conditions outside of the physical operations of the same, and however willing I might be to defer the enforcement of the law as an individual, yet I have no discretion in the matter as an official of the State. I am now compelled to insist on the immediate commencement and speedy prosecution of the work of sinking an escapement-shaft, otherwise you will compel me to resort to extreme measures.

Yours respectfully,

CHAS. EVANS,

State Mine Inspector.

On the 14th of March I visited the mine again, and found only four men at work in the west entry. The rock in the coal had become so thick that the mine could not be profitably operated under the circumstances; the west entry was driven as a prospect entry to test how far the rock extended in that direction. I found that nothing had been done as yet in the matter of sinking an escapement-shaft, and the company would not consent to sink one, under the existing outlook, and asked for more time to test the extension of the trouble met with in the mine. From a practical view of the situation, I would willingly grant them time to prospect the mine further, as a large amount of

money has already been expended in the equipment and the opening up of the mine, and unless the rock runs out, or gets considerably thinner, the mine could not be operated satisfactorily. But the law in this matter allows the Inspector no discretionary powers; for this reason I could not consent to any extension of time. The four men that were at work in the prospect entry asked the privilege of working in the mine at their own risk and responsibility until the first of May.

July 17 another visit was made to the mine, and it was found idle, but preparations were being made to run the mine during the fall and winter; as no move had been made toward the sinking of the escape-shaft, the following notice was given the company :

JEFFERSON CITY, Mo., July 23, 1894.

Locust Valley Coal Co., Milan, Mo.:

GENTLEMEN—I visited your mine at Milan on the 17th of this month, and was greatly disappointed in finding that nothing had been done in the matter of sinking an escapement-shaft. You have had repeated notices from this department, for the past two years, to sink an escapement-shaft in accordance with the demands made by the laws of the State. You have asked for an extension of time, and the same has been granted. On the 14th day of last March, at your request, I extended the time until the 1st of May, following, in order that you might test the coal on the west side. Failure to again comply resulted in the prosecuting attorney being notified to bring suit, and upon your further promise to comply with the law, the prosecuting attorney was instructed not to bring suit, and yet after all of this delay I find your promise unkept, and nothing whatever done in the way of sinking the shaft. I fully realize your situation, and am sorry to be compelled to resort to extreme measures, but under the circumstances I must now act. The only avenue of escape at your shaft being surrounded at the top by pine buildings, and in case of fire, would result in the miners being smothered to death; this is too great a risk for either you or I to take. In view of the above, and my sense of official duty, I pronounce the fact that your mine is being operated in direct opposition to the mining laws and in violation of the laws of the State of Missouri, and I hereby order the mine closed until an escapement-shaft is completed. Each day that you operate your mine after this notice, you will do so in violation of law, and become liable for the penalties attaching for such violation. Please govern your operations and acts in accordance with the instructions herein, and oblige,

Yours respectfully,

CHAS. EVANS, State Mine Inspector.

VERNON COUNTY.

Production, 297,599 tons.

- During the past year, all of the large coal-producing counties fell off in output except Vernon county. It has increased its output for the year 63,223 tons, or 27 per cent; and for the past four years the increase has been nearly 900 per cent. From the twelfth place in the order of production five years ago it has moved up to third place, with

a most excellent opportunity for a still further advance. Twenty-two mines are being operated, of which five are shafts, six are slopes and 11 are strip-pits; steam-power is used at six of the mines, horse-power at two, and hand-power at three.

The mines are ventilated by six fans and one furnace, and four have natural ventilation. The room and pillar system is exclusively practiced. The powder consumed the past year amounted to 16,523 kegs, costing \$32,769. The average number of men employed winter and summer was 550 miners and 186 other employes. There were three fatal and one non-fatal accidents.

The tonnage for the past year was 297,599, with an average price of 1.11 per ton, amounting to \$330,342. The Mo. Pac., M. K. & T. and K. C., Ft. S. & M. railroads, passing through the coal field, furnish good shipping facilities for the coal. Following is a description of the larger mines, with a statement showing their condition as they were found on dates of inspection.

CARBON CENTRE POSTOFFICE.

Very little mining is done at Carbon Centre at present.

Geo. Husleton opened a drift from the bottom of a strip-pit, and the coal was brought out with mules and shipped to Kansas City over the K. C., Ft. S. & M. railroad. All work was confined to drawing pillars, at date of inspection. The mine is now abandoned.

Andy Scott is operating a drift mine, in fall and winter, to supply local trade.

Clay Lyons.—Drift opening. Mine located west of Carbon Centre. A few men are employed, to supply home trade. There are several other parties stripping coal in this locality for home consumption.

MOUNDVILLE POSTOFFICE.

There are several mines operated in the vicinity of Moundville, supplying the home demand. The coal is about 26 inches in thickness, worked on the room and pillar plan. The pay for mining is 75 cents per ton for clean coal.

Phil. W. Jones.—Shaft 30 feet deep; horse-power. Three men employed, and the product is consumed in the surrounding country.

W. D. Robinson.—Shaft 32 feet deep; horse-power. Six men employed, and the mine only operated in the fall and winter. This is the most productive mine in this locality. The coal is consumed in the immediate vicinity.

Gil. Clark operates a mine; shaft 15 feet deep. Two men employed. Coal consumed at Moundville.

Dave Perkins opened a new slope last fall, and has three men employed to supply home consumption.

Cooper & Son are operating some strip-pits north of Moundville, and hauling the coal to Nevada, where it is consumed.

There are other parties operating mines on a small scale at Bellamy Bronaugh, Ketterman, Milo, Sheldon, Schell City and Walker, by mining and stripping, to supply the home demand.

RICH HILL POSTOFFICE.

Arthur Coal Co.—S. J. Hudson, president, Frank Williams, superintendent. Mine situated 5 miles south of Rich Hill, near Arthur station. The covering overlying the coal at this mine is very shallow, which makes underground mining impractical, and the coal is obtained by stripping. Coal runs from 5 to 6 feet in thickness, and is hauled on a tram-road for over a mile, loaded on cars and shipped to market over the Mo. Pac. railroad.

Bedford Coal Co, Thos. McCombs, supt.—Mine located near Bedford, four miles south of Rich Hill. Shaft 45 feet deep and equipped with good machinery. Ventilation is produced by a 10-foot fan, which was causing a sufficient amount of air to circulate around the workings. This is a new mine, sunk in the summer of 1893; shipments began in September of the same year. The machinery and equipment is new. An escape-shaft has been sunk and partitioned off into two compartments, one for the air to travel and a stairway built in the other for the men to travel in and out of the mine. Coal varies from $3\frac{1}{2}$ to 4 feet in thickness, and is worked on the pillar and room plan, and 50 cents per ton is paid for mining unscreened coal. Employment is given to about 50 men. A switch has been built to the mine, by the Mo. Pac. R. R. company, giving it a shipping connection over that railroad.

Central Coal and Coke Co., John Perry, general manager, and David Mackie, general superintendent.—This company owns two mines in this county; but only one of them has of late been operated.

Mine No. 7.—J. H. Williams, foreman. Mine located about three and one-half miles south of Rich Hill and about a mile west of Bedford; connected with the Missouri Pacific railroad by a switch. Shaft 140 feet deep; equipped with first-class machinery. This mine is one of the large coal producers of the state, and its output is exceeded only by Mine No. 15 of the Rich Hill Coal Co. Three inspections have been made of this mine during the past year. First inspection was made October 6, and mine found in very good condition; the fan was making 76 revolutions per minute, and was removing 34,800 cubic feet of air in same time. This volume of air is circulating through the work-

ings in one undivided current, which method, in view of the much improved modern methods employed in ventilating mines, may be classed as out of date and behind the times. The amount of air traveling through the mine was found above the requirements of law, and at no place was any deficiency found. Yet, when the air has to travel through airways for thousands of feet, where the decay of material is constantly going on, and the air coming in contact with the organic matter thus thrown off, renders it unfit to inhale. I cannot too strongly condemn the method of ventilating large and extensive mines with the one current of air.

Second inspection was made January 10th, and the mine found in good condition. All of the work on the north side was confined to drawing back pillars, and that part of the mine will soon be abandoned. Third inspection was made May 10th, and the ventilation was found above the requirements of the law, and the safety appliances in good repair. A careful examination was made of all of the abandoned workings on each inspection, and the mine was found clear of any gas, and a current of air found traveling through all the old workings. Shot-firers are employed by the company, and no shot is allowed to be fired until all the miners have retired from the mine. Gas men are also employed to go around the workings every morning to see that the mine is safe for the miners to enter. The coal varies from $3\frac{1}{2}$ to 5 feet in thickness, and is worked on the pillar and room plan, the company paying 50 cents per ton for mining unscreened coal. The mine gives employment to 175 men, and has an output of 1000 tons daily. The coal is consumed at Kansas City and points north and west.

Mine No. 8, John Mackie, foreman.—This mine is located about a mile south of No. 7, and is equipped with first-class machinery, but unfortunately the shaft was sunk where the coal was faulty and irregular, and very little mining has been done at this mine during the past year. During the month of February the mine closed down temporarily.

Rich Hill Coal Company.—This company operates two mines in this county, under the same management as that of the mines of Bates county. Both are new mines, and are working the same seam of coal as that worked in the other mines of this company, in the same locality.

Mine No. 16.—Joe Davidson, foreman; mine located four miles south of Rich Hill, near Bedford station; slope opening, and the product is brought to the surface by steam-power. On my first visit to this mine, October 10, I found it idle, owing to the plant having been burned down a few days before; hence no inspection was made. I again visited and made an inspection of the mine January 8, and found it in good condition; ventilation was produced by a 10-foot fan, which

was making 95 revolutions per minute, and removing 35,915 cubic feet of air in same time. This entire volume of air was traveling around the workings in one undivided current, but preparations were being made to erect overcasts, and split it into separate divisions.

The coal runs from 3½ to 5 feet in thickness, and more regular than found on former inspections; it also runs level and the mine may be considered a good one. It is worked on the room and pillar plan, and 50 cents per ton is paid for mining unscreened coal. The mine gives employment to about 100 men and boys. The product is shipped to market over the Mo. Pac. R. R.

Mine No. 17, Alex McKinnan, foreman.—This is a shaft 125 feet deep, equipped with good machinery. First inspection of this mine was made October 6, and was found in good condition, with the requirements of the law closely observed. On this inspection the fan was located on top of an air-chamber, partitioned off at one end of hoisting-shaft. It was giving satisfaction, as the air was circulating through the workings in adequate quantity. An escapement-shaft was found in process of construction. January 15, I again inspected the mine, at which time I found the escapement shaft completed, with a partition in it, dividing it into two compartments, in one of which a stairway had been built for the ingress and egress of the miners; while the other compartment was reserved for the air, to which point the fan had been removed. The fan is 15 feet in diameter, and at the time of my visit was making 60 revolutions per minute and was removing 41,385 cubic feet of air in same time. This volume of air is divided into 3 splits; the main current travels the east and west entries, and divide to the north and south, returning to the fan over an air-crossing.

May 11 I made another inspection, and found the mine in first-class condition, with the machinery, ropes, cages and safety-catches in good repair. This is a well-equipped mine, opened out practically, and calculated to be a large producer, and in fact, has a large output now for a new mine, but unfortunately for the miners as well as the company, the coal is faulty and irregular, which rather limits the capacity of the mine. Coal runs from 3 to 6 feet in thickness, and is worked on the room and pillar plan. Employment is given to 125 men and boys. The product is shipped over the Mo. Pac. railroad to Kansas City and points west and northwest.

Vernon County Coal Co.—H. Wise, superintendent. Mine situated 3½ miles south of Rich Hill, and connected by a switch with the Mo. Pac. railroad. Slope opening, and operated by steam-power. Ventilation is produced by a 10-foot fan, and the mine is well ventilated.

First inspection was made October 7, and the mine found in very fair condition.

January 8 another inspection was made, when the ventilation was found up to the requirements of the law.

Another inspection was made May 10, when the fan was found running 90 revolutions per minute, and removing 23,540 cubic feet of air in same length of time. This volume of air was circulated around the workings, in one undivided current, which system is as old as the coal itself, and cannot be too strongly condemned as impractical in the light of modern methods, and unworthy of any mine boss or superintendent to practice. Some gas is thrown off in the north entry, and the company has been notified to employ gasmen to go around the mine every morning and see that the same is safe before the miners be allowed to enter it; also, that it must employ shot-firers, to fire all shots after the miners retire from the mine. The company has also been notified to provide a safer way for the men to travel in and out of the mine. Coal from four to five feet in thickness, and worked on the double-entry room and pillar plan. Employment is given to about 90 men, and 50 cents per ton is paid for unscreened coal.

TABULAR STATEMENTS.

REMARKS ON TABLE V.

The following table embraces in detail the coal-mining operations of each county in the State producing coal, and from which may be seen as follows :

The kind of power used, with number of steam and horse-power plants in each county ; also the kind of opening, shaft, slope, drifts and strip-pits, and the number of each in operation ; number of mines per county, kind of ventilation, and the number of fans and furnaces used in producing ventilation ; method of working—long-wall or pillar and room ; number of kegs of powder used in mining coal and cost of same ; number of miners employed in winter and the number in summer ; the same as to other employes in and about the mines ; number of fatal and non-fatal accidents ; the total number of tons of coal produced by each county, the average price per ton received at the mines for coal, and the total amount received for the product.

Table 6 represents each county, with the details of each mine in the respective counties, tabulated after the order and in the manner enumerated above.

TABLE V, SHOWING BY COUNTIES THE PLANT, EMPLOYEES, COAL MINES FOR YEAR

Counties.	Kind of opening				No. mines operated.	Kind of power used					How ventilated.			Mode of working.	
	Shafts.	Slopes	Drifts.	Strip-pits		Steam.	Horse.	Hand.	Electricity	Compressed air	Natural.	Furnace.	Fan.	Long-wall	Other and room.
Adair	2		1		3		3					3			3
Audrain	12				12	4	8					2			3
Barton	3	3	3	5	14	3	3	7				3	2	9	9
Bates	5	10	3	25	43	6	11	1				5	6		18
Boone	4	3	2	3	12	4	5	4				2		1	8
Caldwell	4				4	4						1			
Callaway	4	3	5		12	1	5	6				6		7	5
Carroll	1			1	2		1					1			3
Cedar			3		3			3				3			3
Chariton			1	1	2			1				1		1	
Clay	1				1	1							1		1
Cole	1				1		1					1			1
Cooper	1		2	1	4	1						3		1	5
Dale		4	1		5		4	1				5			
Grady	2				2	2								2	2
Henry	21	8	2	4	35	6	16	9				14	12	5	25
Jackson	1				1	1						1	1		
Johnson	2	6	4		12	1	1	9				9	2		12
Lafayette	29	6	20		55	10	24	21	1			18	32	5	52
Linn	6				6	2	4					6	1	5	1
Livingston	1				1		5					1			
Macon	11	3	10	2	26	12	7	5				7	7	10	4
Montgomery	1				1	1								1	1
Nodaway	2	3			5		3	2				4	1	4	4
Pettis	1		1		2	1		1				2			1
Putnam	4	2	4		10	4	1	5				6	3	1	8
Ralls					1							1			2
Randolph	11	3	15		29	6	8	15				3	21	6	25
Ray	21	1	3		25	10	12	3				5	16	4	25
Saline	1		1		2		1	1				1			1
Schuyler	1				1		1								1
Sullivan	1				1	1									1
St. Clair	3	3	2	2	10		4	4				5	3	1	11
Vernon	5	6		11	22	6	2	3				4	1	6	11
Totals	162	65	83	55	365	83	123	104	1		114	140	56	130	387

ONNAGE AND VALUE OF THE OUTPUT OF MISSOURI NDING JUNE 30, 1894.

Powder.		No. mules worked in the mines		Employees.						Total number of tons coal mined in each county.....	Average price received per ton at the mines.	Amount received for the total output, June 30, 1893, to June 30, 1894.....	Casual- ties.	
				Number of miners.		Other employees.		Total number.					Fatal.....	Non-fatal.
Winter...	Summer...	Winter...	Summer...	Winter...	Summer...	Winter...	Summer...	Winter...	Summer...					
...	...	6	5	61	32	11	6	72	38	20,744	\$1 45	\$30,250	...	...
69	8125	3	3	139	101	28	28	167	124	43,910	1 47	64,724	1	1
229	4,458	12	13	162	137	48	51	200	188	55,767	1 04	58,224	...	...
330	23,934	55	53	576	527	269	207	845	734	291,271	1 04	305,198	2	3
209	879	3	2	66	29	15	11	81	40	19,038	1 49	28,428	...	...
...	...	7	6	112	62	25	19	137	81	22,869	1 79	41,018	...	...
...	...	1	...	89	35	12	5	92	40	23,223	1 58	36,636	...	...
...	...	...	...	3	1	...	...	3	1	920	1 42	1,600	...	...
...	...	...	...	6	1	1	...	7	1	730	1 50	1,096	...	...
...	...	...	...	3	...	...	...	3	...	185	2 10	407	...	...
75	140	...	...	45	40	13	11	58	51	19,371	1 60	30,895	...	...
...	...	...	...	4	4	2	2	6	6	2,000	1 50	3,000	...	...
...	...	...	...	9	9	5	2	14	11	2,639	2 00	5,278	...	...
...	...	...	...	14	5	3	1	17	6	2,327	1 50	3,492	...	...
47	105	6	6	160	110	48	40	208	150	35,000	1 90	66,625	...	...
1,103	5,933	6	6	818	176	86	59	404	235	84,473	1 44	122,059	...	5
...	...	...	...	45	45	10	10	55	55	6,720	1 95	13,104	4	2
539	1,060	1	1	66	20	6	4	72	24	15,427	1 46	22,425	1	...
70	115	35	27	1,299	751	192	139	1,491	890	290,931	1 52	457,459	...	...
25	50	7	7	158	138	28	27	186	165	61,807	1 54	95,221	...	...
...	...	...	...	6	3	1	1	7	4	800	2 00	1,600	...	...
1,198	26,149	104	102	1,224	999	323	262	1,647	1,261	511,566	1 07	546,772	3	6
...	...	...	...	...	40	...	9	...	49	12,175	1 35	16,500	...	...
...	...	...	...	23	7	1	...	24	7	2,984	2 56	7,560	...	...
...	...	...	...	7	6	1	1	8	6	1,738	1 91	3,394	...	...
...	...	20	18	488	398	82	82	570	480	119,832	1 31	157,677	...	2
...	...	...	...	8	8	2	2	10	10	4,400	1 10	4,840	...	...
970	7,972	40	35	606	423	149	113	755	536	209,656	1 11	234,608	3	6
...	...	30	22	764	422	127	68	891	490	196,852	1 50	296,634	1	1
...	...	...	...	...	7	...	3	...	10	1,875	2 22	4,162	...	...
4	7	1	...	13	...	3	...	16	...	3,556	1 25	4,945	...	...
300	600	...	...	13	3	4	2	17	5	6,000	1 25	8,250	...	...
46	89	1	1	28	17	8	2	36	19	5,337	1 61	8,612	...	...
523	32,769	62	62	572	528	193	179	765	707	297,599	1 11	330,342	3	1
728	103,885	398	371	7,168	5,083	1,696	1,341	8,864	6,424	2,383,322	1 26	3,013,075	19	27

TABLE VI—SHOWING, BY COUNTIES, KIND AND NUMBER WORKING SAME, KIND OF PLANT, NUMBER OF MEN OF COAL FROM THE RESPECTIVE MINES FOR THE THE PRODUCT.

ADAIR

Name of company.	Operator.	No. of days worked.	Kind of opening.	Depth of shaft—feet.	Thick-ness of coal.		Power employed.			
					Feet.....	Inches...	Steam	Hand	Horse	Electricity
Besanko's mine	Longburger & McCabe ...	150	1	20	4	8	1	1	1	1
Scott M. & S.	D. C. Scott	120	1	42	4	2	1	1	1	1
Stahl mine.....	H. C. McCahan.....	210	1	1	3	6	1	1	1	1
Totals .....	.....	2	1	1	1	1	3	1	1	1

AUDRAIN

Davis mine	C. C. Davis	180	1	41	4	8	1	1	1	1
Detiene mine	O. J. Detiene	150	1	40	2	6	1	1	1	1
Eastham mine	C. P. Eastham	90	1	30	2	6	1	1	1	1
Farber Coal Co.	Farber Coal Co.	171	1	104	2	4	1	1	1	1
Harrison mine	A. M. Harrison	130	1	56	1	2	1	1	1	1
Laddonia Coal Co.	C. W. Turpin	233	1	55	2	4	1	1	1	1
McGuire, Mrs. M.	Samuel McGuire.....	156	1	16	4	6	1	1	1	1
Silver's mine	L. Silvers	104	1	34	2	6	1	1	1	1
Taylor & Co (Martinsbury C. Co)	W. F. Taylor & Co	120	1	105	2	6	1	1	1	1
Vandalia Coal Co.	Vandalia Coal Co.	150	1	72	2	6	1	1	1	1
Vandalia Fire Brick & Coal Co.	Vandalia F. B. & C. Co.	100	1	85	2	4	1	1	1	1
Weber mine	E. D. Weber	70	1	42	2	6	1	1	1	1
Totals .....	.....	12	1	1	1	1	4	8	1	1

BARTON

Betz Bros. mine	Jacob Betz	101	1	2	2	1	1	1	1	1
Boulware Bros. mine	Lavery Bros	130	1	4	2	4	1	1	1	1
Cameron mine	M. H. Wilhelm	100	1	1	2	1	1	1	1	1
Clark-Wilson mine	Henry Becker	85	1	1	1	1	1	1	1	1
Etrich mine	Daniel Kimball	75	1	1	1	1	1	1	1	1
Hanshaw, W. H.	W. H. Hanshaw	60	1	2	2	2	1	1	1	1
Lanyon, R. H.	Minerd Bros	49	1	45	3	3	1	1	1	1
Ryan, G. G.	Cook	60	1	2	2	2	1	1	1	1
Spear mine	M. M. Spear	75	1	1	1	1	1	1	1	1
The Wear C. Co., Minden mine	The Wear Coal Co.	125	1	40	2	10	1	1	1	1
" " Vernon mine.	" "	90	1	42	3	1	1	1	1	1
Whitsell mine	H. J. Whitsell	125	1	1	2	6	1	1	1	1
Wilson, G. H.	Liberal Coal Co.	250	1	1	2	5	1	1	1	1
Totals .....	.....	3	3	5	1	3	7	1	1	1

OF COAL MINES OPERATED, THE METHOD OR PLAN OF
EMPLOYED, PRICES PAID AND RECEIVED, TOTAL OUTPUT
YEAR ENDING JUNE 30, 1894, AND AMOUNT RECEIVED FOR

COUNTY.

How venti- lated.	Pl'n	Powder used.	No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal received at mine ..	Total amount received for product of the year ending June 30, 1894	
				Miners.			Others.			Total.	Winter ..				Summer ..
				Winter ..	Summer ..	Winter ..	Summer ..	Winter ..	Summer ..						
Natural ..	Pillar & R	Cost	Winter ..	Summer ..	Winter ..	Summer ..	Winter ..	Summer ..	Winter ..	Summer ..					
.....	Long wall	Number of kees ...													
.....	Diameter of fan, feet														
.....	Fan														
.....	Furnace														
.....	Natural ..														
1	1				8	1	9	3	75	75	2,400	\$1 25	\$3,000		
1	1				2	1	10	3	75	75	2,167	1 25	2,710		
1	1		6	5	45	30	8	5	53	35	16,177	1 52	24,540		
3	3		6	5	61	32	11	6	72	36	20,744	1 45	30,250		

COUNTY.

1	1	1	1	61	107	20	10	5	3	25	13	75	65	7,000	\$1 60	11,220
1	1	1	1	3	7	3	2	1	1	4	2	90	99	646	1 62½	1,050
1	1	1	1	1	1	2	1	1	1	2	1	1 00	1 00	160	2 00	320
1	1	1	1	1	1	10	5	3	3	13	8	80	80	2,838	1 45	4,115
1	1	1	1	1	1	2	1	1	1	3	1	62	62	480	1 40	672
1	1	1	1	1	1	4	2	1	1	5	3	1 00	1 00	1,114	1 30	2,117
1	1	1	1	1	1	2	1	1	1	3	2	75	75	600	1 50	900
1	1	1	1	5	11	3	1	1	1	3	1	25	25	320	2 00	640
1	1	1	1	1	1	30	20	4	3	34	23	92	92	5,795	1 45	8,404
1	1	1	1	1	1	50	50	8	8	58	58	86	86	21,452	1 40	30,030
1	1	1	1	1	1	11	11	4	4	15	15	86	86	5,394	1 50	5,691
1	1	1	1	1	1	2	2	2	2	2	2	1 50	1 50	110	1 50	165
2	2	2	2	89	125	3	3	139	101	28	23	167	124	43,910	1 47	64,724

COUNTY.

1	1	1	1	1	1	2	1	3	70	492	\$1 25	543					
1	1	1	1	1	1	2	2	2	2	60	50	627					
1	1	1	1	1	1	2	2	2	2	280	1 00	280					
1	1	1	1	1	1	4	2	4	2	1 25	1 00	780					
1	1	1	1	1	1	3	3	3	3	480	1 45	700					
1	1	1	1	1	1	2	2	2	2	255	1 40	357					
1	1	1	1	1	1	2	2	2	2	1 06½	50	6,962	87½	6,090			
1	1	1	1	1	1	2	1	3	1	1 00	320	1 25	400	400			
1	1	1	1	1	1	2	2	2	2	175	1 75	315	315	315			
1	1	1	1	1	1	18	10	4	3	22	13	60	52½	6,329	1 00	6,329	
1	1	1	1	1	1	55	85	20	24	75	109	60	52½	28,799	1 00	28,799	
1	1	1	1	1	1	7	7	7	7	2,670	1 12½	3,004	3,004	3,004	3,004	3,004	
1	1	1	1	1	1	2	1	8	5	12	23	20	75	60	8,000	1 25	10,000
6	1	2	8	2,229	4,458	12	13	152	137	48	51	200	188	55,767	1 04	58,224	58,224

STATISTIC

B.

Name of company.	Operator.	No. of days worked.	Kind of opening.		Depth of shaft—feet.	Thick-ness of coal.		Pow-er.
			Shaft.	Slope.		Feet.	Inches.	
Abston, W. M.	C. G. Denning	234			1	2	8	
Allen & Williams	H. P. Robinson	100			1	3	10	
Black Diamond	C. W. Field	50			1	4	3	1
Bruce & Manville	Bruce & Manville	150			1	4	6	1
Chambers mine	Thos. Harris	100			1	2	9	
Click mine	B. F. Click	100			1	2	6	
Davis, E. G.	J. Ehart	150			1	3	3	
Eyron & Stephens	Eyron & Stephens	100			1	2	6	1
Flansburg mine	J. A. Flansburg & Son	90			1	2	10	
Ford mine	J. A. Ford	100			1	5	4	
Haverfield & Arbogast	David Arbogast	90			1	3	4	
Hopkins mine	S. W. Hopkins	150			1	4	6	
Horton, C. E.	Davis, Johnson & Deering	90			1	2	9	
Horton, C. E.	Deering & Johnson	125			1	2	6	
Hudson mine	Hudson & Co.	125			1	2	10	1
Irish & Morse	R. E. Allen	109			1	5	2	
Johnson mine	J. B. Johnson	90			1	3	3	
Jones mine	C. S. Jones	90			1	2	6	
Kinkaid, Joseph	Pryor & Bender	120			1	2	6	
Lewis mine	John Gerod	150			1	2	10	
Lindsey mine	John Lindsey	30			1	3	3	
Manchester mine	Thos. Manchester & Son	100			70	2	4	1
March mine	John March	90			1	4	6	
Martin, G-e & Ferguson	Martin, Gee & Ferguson	205			1	4	6	1
Morgan mine, J. C.	J. C. Morgan	50			1	8	6	
Peeler mine	D. D. Peeler	170			1	5	3	
Pearson mine	Peter Pearson	248			1	5	6	1
Raney & Washburn	Raney & Washburn	150			45	3	3	1
Rankin Bros	J. C. Rankin	60			1	2	10	1
Rich Hill C. & M. Co., No. 2	Rich Hill C. & M. Co.	14				82	4	2
" " " 4	" " " "	198			1	4	1	
" " " 13	" " " "	12			1	60	4	2
" " " 15	" " " "	125			1	106	4	1
" " " 18	" " " "	128			1		4	1
Skillman mine	Andrew Skillman	90			1	3	3	
Sullivan mine	Wm. Sullivan	208			1	4	4	1
Thomas, J. P.	H. P. Hensley	60			1	3	4	1
Walnut Land Coal Co.	W. G. Hoff	69			1	3	3	
Western Coal Mining Co.	F. M. Bear	75			1	2	10	1
Wilson mine	Thos. Wilson	90			1	3	3	
Wise	J. M. Wise	225			1	4	1	
Russell	M. Russell	90			1	3	3	
Thurman	E. H. Thurman	80			1	2	6	
Totals			5	10	8	25		611

B00

Blackfoot Coal Co.	J. H. Keen	125	1			118	4		1
Carter mine	Smith & Carter	120	1			40	3		1
Columbia Coal Co.	E. L. Hubbard	150	1			112	3		1
Davis mine	Isaac Davis	90	1				3		1
Gordon mine	S. D. Gordon	90	1				2	6	1
Gossett mine	John F. Gossett	60	1				2	6	1
Johnson, F. M.	J. M. Rouse	140	1				3	4	1
Rogers, Henry	Geo. Rogers	60	1			18	2	6	1
Sims, M. J.	M. J. Sims	5				1	4		
Sidham mine	W. A. Sidham	30				1	3	10	
Stone, Jas. W.	James W. Stone	30				1	3		
Rees, Thomas	Thomas Rees	90				1	2	6	1
Totals			4	8	2	3			5

DAL MINES—Continued.

COUNTY.

Locality.	Diameter of fan, feet.	Pillar & R. Long-wall.	Powder used.		No. of mules.		Employees.						Price paid for mining.		Tons of coal mined.	Price per ton of coal received at mine.	Total amount received for product of the year ending June 30, 1894.
			Number of kegs.	Cost.	Winter.	Summer.	Miners.		Others.		Total.	Winter.	Summer.				
							Winter.	Summer.	Winter.	Summer.							
1	1	1	35	59	1	1	2	2	7	7	9	9			8,000	\$1 25	\$10,000
1	1	1	80	1,120	2	2	5	5	1	1	6	6	65	65	300	1 20	360
1	1	1	45	90			25	25	8	8	33	33	50	50	750	1 12½	844
									2	2	2	2			500	1 20	600
									1	1	1	1			200	1 00	200
									2	2	5	5	7	7	1,500	1 25	1,875
									6	6	1	1	Co op	tive	1,020	1 25	1,275
									2	2	2	2			450	1 25	562
									5	5	5	5			1,080	1 25	1,350
									2	2	2	2			500	1 12½	565
									1	1	1	1			1,000	1 00	1,000
											10	10			1,800	1 15	2,070
											20	20			10,000	1 12½	11,250
											5	5	75	75	800	1 16	927
											9	9			3,646	1 20	4,375
											2	2	2		600	1 12½	675
											2	2	2		300	1 12½	337
											4	4	4		2,000	1 00	2,000
											5	5	5		2,000	1 12½	2,250
											2	2	2		120	1 00	120
											3	3	3		520	1 15	650
											2	2	2		260	1 25	325
											20	20	50	50	12,800	1 15	14,145
											4	4			486	1 12½	547
											6	6	75	75	1,400	1 25	1,750
											18	18			2,064	1 12½	2,322
											1	1					
											60	55			3,000	1 35	4,050
											75	75			100	1 15	115
											29	29	69	69	1,561	1 06	1,660
											80	69	69	69			
											69	69	69	69	26,104	1 13	29,731
											51½	51½			5,803	1 25	7,263
											325	325	50	50	131,706	1 08	130,023
											52	52	50	50	24,042	1 02	24,535
											8	8			240	1 12½	270
											14	9			3,808	1 12½	4,284
											4	2	50	48	1,000	1 07	1,070
											13	3	75	75	311	1 12½	350
											3				1,500	1 00	1,500
											3				400	1 12½	450
											40	40	50	50	25,000	95	23,750
											5				1,164	1 20	1,397
											15	5			2,936	1 00	2,936
8	6	18	12,330	23,934	53	53	576	527	269	207	845	734			291,271	1 04	305,198

COUNTY.

1		1	75	131			10	4	2	1	12	5	87½	87½	3,200	1 50	4,800
1		1	80	140			10	5	2	2	12	7	87½	87½	3,600	1 50	5,400
1		1			2	2	25	20	5	5	30	25	80	80	8,800	1 50	13,200
1		1					3				3		87½		498	1 25	627
1		1					5		1		9		87½		1,000	1 20	1,200
1		1	3	6			1				1		1 00		100	1 25	125
1		1	35	70	1		5		1		6		87½		1,120	1 35	2,000
1		1	12	24			2				3		85		280	1 50	420
									3						50	1 25	63
											2				100	1 50	150
											1				50	1 25	63
1		1	4	8			2				2		1 00		240	1 25	300
7		1	209	379	3	2	68	29	16	11	81	40			19,038		28,423

STATISTICS OF

CALDWELL

Name of company.	Operator.	No. of days worked.	Kind of opening.			Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.		
			Drift	Slope	Strip-pit.		Feet	Inches	Steam	Hand	Air
Caldwell Coal Co	Caldwell Coal Co.....	218	1			365	1	6	1		
Cowgill	Cowgill	120	1			350	1	10	1		
Hamilton	Hamilton	160	1			300	1	10	1		
Kingston	Kingston	203	1			242	1	8	1		
Totals			4						4		

CALLAWAY

Bishop mine	Bishop & Cumberland	200	1			2			1		
Carbon Valley mine	Flowers & Simmons	250		1		2	6		1		
Castle mine	Wm. Castle	280		1		2	4		1		
Criawell, W.	R. M. Henderson	50		1		2			1		
Curd, E. D.	F. Lamferous	125	1			2	6		1		
Curd mine	Edward Curd	140		1		1	10		1		
Fulton Fire-brick & Mining Co.	Fulton F. B. & M. Co.	250	1			100	2	6	1		
Harris mine	John Harris	192	1			40	2	6	1		
Henderson, J. S.	Wm. Allen & Son	180	1			25	2	9	1		
Marsenkoff mine	John Marsenkoff	208	1			50	3		1		
Smith mine	James Smith	150		1		2	8		1		
Weeks mine	John Litel	120		1		2	6		1		
Totals			4	3	5				1	5	6

CARROLL

Farr mine	Ralph Farr	200			1	2					
Wallace Preston	Geo. Williams	90	1			18	1	6	1		
Totals			1		1				1		

CEDAR

Davis mine	A. B. Davis	60		1		2	4		1		
Duncan mine	J. C. Duncan	60		1		2			1		
Poage mine	G. M. Poage	100		1		2	2		1		
Totals				3						3	

CHARITON

Huenten, John	R. Brewer	90		1		1	6		1		
Isle mine	E. W. Isle	20		1		1	4		1		
Totals				1	1				1	1	

CLAY

North Kansas City C. & M. Co.	North K. C. C. & M. Co.	170	1			435	1	10	1		
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COAL MINES--Continued.

COUNTY.

Locality.	Diameter of fan, feet	Pillar & R. Long-wall	Powder used.	No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal received at mine ..	Total amount received for product of the year ending June 30, 1894	
					Miners.			Others.			Total.					
					Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.				
1	10	1	.....	2	2	43	25	10	9	53	34	1 12½	1 00	9,989	1 65	16,482
1	10	1	.....	5	5	5	1	1	6	6	1 50	1 50	600	2 00	1,200	
1	10	1	.....	4	40	20	8	5	48	25	87½	75	8,061	1 80	15,525	
1	10	1	.....	24	12	6	4	30	16	1 12½	1 12½	4,219	1 94	7,811		
1	2	4	.....	7	6	112	62	25	19	137	81	.....	.....	22,869	.....	41,018

COUNTY.

1	1	1	.....	3	2	.....	3	2	1 00	1 00	1,000	1 50	1,500	
1	1	1	.....	4	2	.....	4	2	1 12½	1 12½	1,582	1 99	3,148	
1	1	1	.....	3	2	.....	3	2	1 10	1 10	1,244	1 50	1,868	
1	1	1	.....	2	.....	.....	1	.....	1 25	.....	80	2 00	160	
1	1	1	.....	2	.....	.....	2	.....	1 00	.....	600	1 50	900	
1	1	1	.....	5	.....	2	7	.....	1 06½	.....	1,669	1 69	2,715	
1	1	1	.....	40	20	5	4	45	24	1 00	1 00	12,000	1 55	18,600
1	1	1	.....	6	6	1	1	7	7	1 00	1 00	1,840	1 50	2,760
1	1	1	.....	5	2	1	.....	6	2	1 00	1 00	793	1 75	1,200
1	1	1	.....	2	1	1	.....	3	1	1 00	1 00	560	1 50	840
1	1	1	.....	1	.....	1	.....	9	.....	1 00	.....	1,765	1 50	2,647
1	1	1	.....	1	.....	1	.....	2	.....	1 00	.....	150	2 00	300
6	7	5	1	80	35	12	5	92	40	23,223	1 57	36,636

COUNTY.

1	1	1	.....	2	1	.....	2	1	1 00	.....	800	1 75	1,400
1	1	1	.....	1	.....	.....	1	.....	1 00	.....	120	1 66	200
1	1	1	.....	8	1	.....	3	1	.....	.....	920	.....	1,600

COUNTY.

1	1	1	.....	3	.....	1	4	.....	1 00	.....	333	1 50	500
1	1	1	.....	1	.....	.....	1	.....	1 00	.....	97	1 50	146
1	1	1	.....	2	1	.....	2	1	1 00	75	300	1 50	450
1	1	1	.....	6	1	1	7	1	.....	.....	780	.....	1,096

COUNTY.

1	1	1	.....	2	.....	.....	2	.....	1 00	.....	150	2 25	337
1	1	1	1	1	35	2 00	70
1	1	1	8	3	185	407

COUNTY.

1	30	1	45	40	13	11	58	51	1 12½	1 12½	19,371	1 60	30,996
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STATISTICS OF

COLE

Name of company.	Operator.	No. of days worked.	Kind of opening.		Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.		
			Shaft	Slope		Feet	Inches	Steam	Horse	Electricity
Leach, Geo. H.	Geo. H. Leach	170	1		170	1-20		1		

COOPER

Hazell Springs Coal Co.	Chas. W. Hazell	60		1		1	4		1	
Jenkins mine	Robt. McCluey	90		1		1	6		1	
Missouri Valley Coal & M. Co.	Missouri V. C. & M. Co.	130	1		96	1	2	1		
Stanley Coal Co.	Stanley Coal Co.	90		1		6				
Totals			1	2	1			1	2	

DADE

Clayton, W. R.	R. M. Sharp	90		1		2			1	
McCluey mine	Robt. McCluey	120		1		2	4		1	
McCombs mine	O. P. Ramsey	30		1		2	6		1	
McGarvey's mine	Thos. Allen	70		1		2	4		1	
Seaton's mine	W. E. Seaton	90		1		2	9		1	
Totals				4	1				4	1

HENRY

Avery, A. C.	Stockton Bros	192	1			86	2	2	1	
Ballanger, Sam'l	B. W. Huey	120		1			3	2	1	
Beedy mine	W. E. Hughes	205	1			17	4	6	1	
Blanchard mine	D. C. Blanchard & Sons	160	1			40	3	2	1	
Brown Coal Co.	Edward Brown	115	1			50	3	4	1	
Central Coal and Coke Co.	Central Coal and Coke Co	140	1			60	2	6	1	
Co-operative Coal Co.	Co-operative Coal Co.	180	1			76	2	8	1	
Colorado Blair mine	Hunt, McFadden & Co.	20	1			32		1		
England mine	Wm. England	50	1			25	2		1	
Gedney	A. P. Fonda Est	160	1			32	2	6	1	
Geahart	Theodore Geahart	175		1			1	3		
Gibbs	Henry Gibbs	30		1			1	3		
Griffin, John B.	T. P. Hunt	70		1			1	8		
Hines, F. B.	J. W. Shook	203	1			40	4	10	1	
Hurst mine No. 1	Wm. Hurst	120		1			3		1	
Hurst, John	John Hurst	125	1			35			1	
Hurst, J. W.	J. W. Hurst	45	1			25		9	1	
McCardell mine	John McCardell	85	1			35			1	
McCloud mine	Alex. McCloud	160	1			32			1	
McFadden mine	McFadden & Co	120		1					1	
Mann, James	John W. Martin	60		1				6	1	
Miller, W. J.	L. W. Beaman	205	1			40		8	1	
North Clinton Coal Co.	North Clinton Coal Co	160	1			50	2	6	1	
Owens mine	B. L. Owens	110		1					1	
Parks mine	Bert Carpenter	30		1					1	
Pigg, D. B.	D. B. Pigg	80		1				6	1	
Reese mine	Wm. Reese	145		1					1	
Rusk mine	Wm. Rusk	250	1			40		8	1	
Schlicker, W.	John Addell	60		1		40		6	1	
Stephens mine	Henry Stephens	200		1					1	
Stewart mine	W. H. Stewart	1		1				3		
Terrill, R.	Michaels & Sheridan	100	1			21	3	3	1	
Thompson mine	R. L. Thompson	120	1			47	3	4	1	
Tyler estate	Not operating June 30, '94	120	1			35	2		1	
Victor, S. M.	Keller & McKeal	35		1			1	10		
Totals			21	8	2	4		6	16	9

COAL MINES—Continued.

COUNTY.

How ventilated.	Diameter of fan, feet.	Pl'n	Powder used.		No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal received at mine...	Total amount received for product of the year ending June 30, 1884.	
			Cost	Number of kegs ...		Miners.			Others.			Total.	Summer ..				Winter ..
						Summer ..	Winter ..	Winter ..	Summer ..	Winter ..	Summer ..							Winter ..
Natural...	Fan.	Long wall	140	75	1	4	4	2	2	6	6	.....	.....	2,000	1 50	3,000

COUNTY.

1	...	1	...	...	...	...	2	2	2	1	4	3	1 50	1 37½	478	2 00	948
1	...	1	...	...	...	...	1	1	1	...	2	1 50	...	...	150	2 00	300
1	...	1	...	...	...	...	6	3	2	1	8	4	75	75	1,116	2 00	2,282
...	...	...	...	...	...	...	4	...	...	...	4	...	...	...	900	2 00	1,800
3	...	1 2	...	...	...	...	9	9	5	2	14	11	...	...	2,639	...	5,278

COUNTY.

1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
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COUNTY.

...	1	...	1	172	301	...	6	4	1	1	7	5	1 00	1 00	720	2 00	1,440
...	1	...	1	144	230	...	6	4	1	...	7	4	90	80
1	...	1	...	22	44	...	6	1	2	1	8	2	75	75	1,033	1 75	1,808
1	...	1	...	280	448	...	15	3	5	1	20	4	1 00	90	8,786	1 50	5,679
1	...	1	...	7½	150	...	8	4	2	1	10	5	1 00	90	1,090	1 37½	1,499
...	1 14	1	...	1,035	2,070	5	4	50	43	28	78	65	85	75	26,604	1 50	39,906
...	1 8	1	...	60	102	...	20	10	4	4	24	14	70	70	4,680	1 25	5,850
...	1 12	1	...	16	28	...	12	...	...	5	...	...	...	90	320	1 50	480
1	...	1	...	7	7	...	...	...	2	...	2	...	1 00	...	150	1 50	225
...	1 8	1	...	40	70	1	1	20	10	6	28	16	70	85	3,515	1 32	4,640
...	...	...	...	...	...	...	6	6	...	...	6	6	60	60	2,600	1 25	3,250
...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	65	2 00	110
...	...	...	...	...	...	...	2	1	...	...	2	1	1 25	1 25	169	1 75	285
...	...	...	...	40	76	...	8	4	1	1	9	5	75	62½	1,040	1 50	1,560
1	...	1	...	60	105	...	5	...	1	...	6	...	90	...	629	1 25	1,162
...	1	...	1	75	131	...	10	4	1	1	11	5	90	80	2,200	1 50	3,300
...	1	...	1	5	8	...	6	...	...	...	2	...	90	...	97	1 50	145
...	1	...	1	25	50	...	6	...	1	...	7	...	90	...	950	1 50	1,425
1	...	1	...	20	35	...	2	2	1	1	3	3	1 25	1 12½	400	1 90	760
1	...	1	...	125	250	...	10	...	1	...	11	...	90	...	2,600	1 50	3,760
1	...	1	...	...	...	...	2	...	...	...	2	...	75	...	100	1 50	150
1	...	1	...	65	125	...	7	3	...	2	11	5	62½	62½	2,318	1 50	3,478
...	1 8	1	...	...	...	...	15	15	3	3	18	18	90	80	4,700	1 37½	6,463
1	...	1	...	...	...	...	3	...	...	...	3	...	1 25	...	655	2 00	1,310
1	...	1	...	...	...	...	2	...	...	...	2	...	70	...	60	1 75	105
1	...	1	...	70	175	...	15	15	4	4	19	19	70	70	2,200	1 25	2,750
1	...	1	...	40	80	...	3	2	1	1	4	3	90	80	720	1 50	1,080
1	...	1	...	...	...	...	2	1	1	...	3	1	90	80	540	1 75	945
1	...	1	...	3	6	...	2	...	...	...	2	...	1 00	...	115	1 37½	160
1	...	1	...	100	200	...	8	2	...	...	9	2	90	75	4,000	1 25	5,000
...	...	...	...	...	...	...	2	...	...	...	4	...	...	...	500	1 75	875
1	...	1	...	200	400	...	20	6	2	26	2	95	85	...	4,000	1 50	6,000
1	...	1	...	400	800	...	50	30	5	3	55	39	95	85	9,600	1 37½	13,162
1	...	1	...	20	30	...	3	...	1	...	4	...	1 00	...	502	1 75	875
...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	125	1 50	190
14 12 5	6 25	3,103	5,933	6	6	318	176	86	59	404	235	...	...	...	84,473	1 44	122,038

STATISTICS OF

GRUNDY

Name of company.	Operator.	No of days worked..	Kind of opening.			Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.			
			Snail	Slope	Drift		Feet	Inches	Steam	Horse	Hand	Electricity
Grundy County Coal Co.....	Grundy County C. Co.	1	1			168	1	6	1			
		1	1			210	1	6	1			
Totals		2							2			

JACKSON

Kansas City Clay & Coal Co.....	Kansas City C. & C. Co.	192	1			300	1	10	1			
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JOHNSON

Boyd, T. H.	P. D. Fitch	90		1			2	6			1	
Herrington & Co.	L. M. Herrington & Co.	76	1				2				1	
Knob Noster Mine No. 2.	Thos. H. Boyd & Son	246	1	1		67	3	10	1			
Meilley, M. B.	M. B. Meilley	200	1	1		24	1-2			1		
Murley mine	Joseph Murley	90					2	4			1	
Murray mine	Madison Murray	30	1				1	8			1	
Rosemous mine	W. L. Rosemous	70	1				2				1	
Sack, G. H.	John Harding	106	1				2	8			1	
Stawrer, J. P.	M. R. & C. L. Staley.....	35	1				1	6			1	
Tanner's mine	Henry Tanners	60		1			1	6			1	
Wood mine	Benjamin F. Wood.....	203		1			2				1	
Totals		2	6	4					1	1	9	

LINN

Bottomly, J. C.	J. C. Bottomly	110	1			150	2	4	1			
Brookfield Coal & Mining Co....	Brookfield C. & M. Co.	220	1			155	2	4	1			
Clark's Coal mine	Geo. Clark	160	1			140	2			1		
Landreth's mine	Landreth & Son	100	1			130	2	4		1		
Marcelline Coal Co.	Marcelline Coal Co.	243	1			185	2	2	1			
Schaeffer mine	Bernard Schaeffer	160	1			155	2	2		1		
Totals		6							2	4		

LIVINGSTON

Cox, W. A.	W. A. Cox	1				65	1	10	1			
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COAL MINES—Continued.

COUNTY.

How venti- lated	Diame- ter of fan	Pl'n	Powder used.		No of mules.		Employees.						Price paid for mining		Tons of coal mined..	Price per ton of coal received at mine ...	Total amount received for product of the year ending June 30, 1894
			Number of Kegs.	Cost	Winter Summer..	Winter Summer..	Miners.		Others.		Total.	Winter Summer..	Winter Summer..				
							Winter Summer..	Winter Summer..	Winter Summer..	Winter Summer..							
Natural ..	Fan. ...	Pillar & R Long-wall	.....	105	6	6	160	110	48	40	208	150	1 12½ 1 18½	1 06½ 1 12½	35,000	1 90	66,625
.....	47	105	6	6	160	110	48	40	208	150			

COUNTY.

1	9	1	45	45	10	10	55	55	1 50	1 25	6,790	1 95	18,104
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COUNTY.

1	5	1	6	87½	881	1 37½	1 145
1	4	4	87½	574	1 25	684	
1	550	700	1	1	25	10	3	1	28	11	62½	62½	7,100	1 40	9,940
1	180	360	12	8	1	1	13	9	75	62½	4 000	1 50	6,000
1	.....	.....	.....	.....	.....	.....	6	.....	.....	6	.....	75	.....	800	1 25	1,000
1	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	75	.....	40	1 00	40
1	.....	.....	.....	.....	.....	.....	4	.....	.....	4	.....	75	.....	560	1 37½	770
1	.....	.....	.....	.....	.....	.....	2	.....	.....	2	.....	87½	.....	230	1 25	287
1	.....	.....	.....	.....	.....	.....	2	.....	.....	2	.....	1 25	.....	80	2 00	160
1	.....	.....	.....	.....	.....	.....	2	.....	.....	2	.....	1 25	.....	200	1 87½	375
1	3	2	1	2	4	4	1 25	1 00	1,012	2 00	2,024
9	2	11	530	1060	1	1	66	20	6	4	72	24	15,427	22,425

COUNTY.

1	.....	.....	.....	.....	.....	.....	4	3	1	1	5	4	1 25	1 25	1,100	1 75	1,925
1	.....	.....	.....	.....	.....	.....	5	3	2	1	7	4	1 25	1 25	1,500	1 75	2,712
1	.....	.....	.....	.....	.....	.....	7	3	1	1	8	4	1 25	1 25	1,100	1 75	1,925
1	.....	.....	.....	.....	.....	.....	4	2	1	1	5	3	1 10	1 10	1,167	2 00	2,334
1	12	1	25	50	7	7	125	125	22	22	147	147	1 00	1 00	54,500	1 50	81,750
1	.....	.....	.....	.....	.....	.....	13	2	1	1	14	3	1 25	1 00	2,440	1 87½	4,575
5	1	5	25	50	7	7	158	188	28	27	186	164	61,867	95,221

COUNTY.

1	6	3	1	1	7	4	1 25	1 25	800	2 00	1,600
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TABLE VI—SHOWING, BY COUNTIES, KIND AND NUMBER WORKING SAME, KIND OF PLANT, NUMBER OF MEN OF COAL FROM THE RESPECTIVE MINES FOR THE THE PRODUCT.

ADAIR

Name of company.	Operator.	No. of days worked.	Kind of opening.			Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.			
			Shaft.	Slope.	Drift.		Feet.	Inches.	Steam.	Hand.	Electricity.	Air.
Beasanko's mine	Longburger & McCabe ..	150	1	..	..	20	4	..	1	..	..	..
Scott M. & S.	D. C. Scott	120	1	..	..	42	4	2	1	..	..	..
Stahl mine.....	H. C. McCahan.....	210	..	1	..	..	3	6	1	..	..	..
Totals .....	.....	..	2	1	..	..	..	..	3	..	..	..

AUDRAIN

Davis mine	C. C. Davis	180	1	..	..	41	4	8	1	..	..	..
Detiene mine	O. J. Detiene	150	1	..	..	40	2	6	1	..	..	..
Eastham mine	C. P. Eastham	90	1	..	..	30	2	6	1	..	..	..
Farber Coal Co.	Farber Coal Co.	171	1	..	..	104	2	4	1	..	..	..
Harrison mine	A. M. Harrison	130	1	..	..	58	1	8	1	..	..	..
Laddonia Coal Co.	C. W. Turpin	233	1	..	..	55	2	4	1	..	..	..
McGuire, Mrs. M.	Samuel McGuire.....	150	1	..	..	16	4	6	1	..	..	..
Silver's mine	L. Silvers	104	1	..	..	34	2	6	1	..	..	..
Taylor & Co (Martinsbury C. Co.)	W. F. Taylor & Co	120	1	..	..	105	2	6	1	..	..	..
Vandalia Coal Co.	Vandalia Coal Co.	150	1	..	..	72	2	6	1	..	..	..
Vandalia Fire Brick & Coal Co.	Vandalia F. B. & C. Co. ..	100	1	..	..	65	2	4	1	..	..	..
Weber mine	E. D. Weber	70	1	..	..	42	2	6	1	..	..	..
Totals .....	.....	..	12	..	..	..	..	4	8	..	..	..

BARTON

Betz Bros. mine.	Jacob Betz	101	..	1	..	..	2	2	..	1	..	..
Boulware Bros. mine.....	Lavery Bros	130	..	1	..	..	2	4	..	1	..	..
Cameron mine	M. H. Wilhelm	100	..	..	1	..	2	1	..	1	..	..
Clark-Wilson mine	Henry Becker	85	..	1	..	..	1	1	..	1	..	..
Elrich mine	Daniel Kimball	75	..	..	1	..	1	..	..	..	..	..
Hanshaw, W. H.	W. H. Hanshaw	60	..	1	..	..	2	2	..	1	..	..
Lanyon, R. H.	Minerd Bros	49	1	..	..	45	3	3	1	..	..	..
Ryan, G. G.	Cook	60	..	1	..	..	2	2	..	1	..	..
Spear mine	M. M. Spear	75	..	..	1	..	1	..	..	..	..	..
The Wear C. Co., Minden mine.	The Wear Coal Co	125	1	..	..	40	2	10	1	..	..	..
Vernon mine.	..	90	1	..	..	42	..	6	1	..	..	..
Whitsell mine	H. J. Whitsell	125	..	..	1	..	..	6	..	..	..	..
Wilson, G. H.	Liberal Coal Co.	250	..	1	1	..	..	5	..	1	..	..
Totals .....	.....	..	8	3	3	5	..	3	7	..	..	..

OF COAL MINES OPERATED, THE METHOD OR PLAN OF
EMPLOYED, PRICES PAID AND RECEIVED, TOTAL OUTPUT
YEAR ENDING JUNE 30, 1894, AND AMOUNT RECEIVED FOR

COUNTY.

How venti- lated.	Diameter of fan, feet.	Pl'n	Powder used.	No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal received at mine ..	Total amount received for product of the year ending June 30, 1894	
					Miners.			Others.			Total.	Summer. Winter...				Summer. Winter...
					Winter..	Summer..	Winter..	Summer..	Winter..	Summer..						
Natural...	3	1	Cost.....	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..	1 00	80	2,400	\$1 25	\$3,000
Furnace	1	1	Number of kegs...	5	8	2	1	10	3	75	75	1 00	80	2,167	1 25	2,710
...	1	1	Pillar & R	6	45	30	8	5	53	35	1 00	80	16,177	1 52	24,540	
...	3	1	Long wall	6	61	32	11	6	72	38	.....	.....	20,744	1 45	30,250	

COUNTY.

1	1	1	1	1	61	107	20	10	5	3	25	13	75	65	7,000	\$1 60	11,220
1	1	1	1	1	3	7	3	2	1	.....	4	2	90	90	646	1 62½	1,050
1	1	1	1	1	.....	.....	10	5	3	3	13	8	80	80	160	2 00	320
1	1	1	1	1	.....	.....	2	1	1	1	3	3	62	62	2,838	1 45	4,115
1	1	1	1	1	.....	.....	4	2	1	1	5	3	1 00	1 00	480	1 40	672
1	1	1	1	1	.....	.....	2	1	1	1	3	2	75	75	1,114	1 90	2,117
1	1	1	1	1	5	11	3	.....	3	3	3	1	25	25	600	1 50	900
1	1	1	1	1	.....	.....	80	20	4	3	84	23	92	92	320	2 00	640
1	1	1	1	1	.....	.....	50	50	8	8	58	58	86	86	5,796	1 45	8,404
1	1	1	1	1	.....	.....	1	1	11	4	4	15	15	86	21,452	1 40	30,030
1	1	1	1	1	.....	.....	11	11	4	4	15	15	86	86	5,394	1 50	5,091
2	8	2	9	3	69	125	3	3	139	101	28	23	167	124	110	1 50	165
2	8	2	9	3	69	125	3	3	139	101	28	23	167	124	43,910	1 47	64,724

COUNTY.

1	1	1	1	1	.....	.....	2	1	3	70	482	\$1 25	543				
1	1	1	1	1	.....	.....	2	2	2	2	60	50	545	1 15	627		
1	1	1	1	1	.....	.....	4	2	4	2	1 25	1 00	280	1 00	280		
1	1	1	1	1	.....	.....	4	2	4	2	1 25	1 00	520	1 50	780		
1	1	1	1	1	.....	.....	3	.....	3	.....	.....	.....	480	1 45	700
1	1	1	1	1	.....	.....	2	.....	2	.....	1 06½	.....	255	1 40	357
1	1	1	1	1	308	616	6	6	40	30	12	12	52	42	58	50	6,962	87½	6,090
1	1	1	1	1	.....	.....	2	.....	3	.....	3	1 00	320	1 25	400
1	1	1	1	1	.....	.....	2	.....	2	.....	.....	.....	175	1 75	315
1	1	1	1	1	317	634	1	1	18	10	4	3	22	13	60	52½	6,329	1 00	6,329
1	1	1	1	1	1,604	3,208	3	5	55	85	20	24	75	109	60	52½	28,799	1 00	28,799
1	1	1	1	1	.....	.....	7	.....	7	.....	.....	.....	2,670	1 12½	3,004
1	1	1	1	1	2	1	18	8	5	12	23	20	75	60	8,000	1 25	10,000
6	1	2	8	8	2,229	4,458	12	13	152	137	48	51	200	188	55,767	1 04	58,224

STATISTICS OF

BATES

Name of company.	Operator.	No. of days worked.	Kind of opening.		Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.	
			Shaft	Slope		Feet	Inches	Steam	Hand
Abston, W. M.	C. G. Denning	234	1	1	2	8			
Allen & Williams	H. P. Robinson	100	1	1	2	10			
Black Diamond	C. W. Field	50	1	1	3	3			
Bruce & Manville	Bruce & Manville	150	1	1	4	1			
Chambers mine	Thos. Harris	100	1	1	2	9			
Click mine	B. F. Click	100	1	1	6	6			
Davis, E. G.	J. Ehart	150	1	1	3	3			
Eyron & Stephens	Eyron & Stephens	100	1	1	2	6			
Flansburg mine	J. A. Flansburg & Son	90	1	1	10	10			
Ford mine	J. A. Ford	100	1	1	5	4			
Haverfield & Arbogast	David Arbogast	90	1	1	3	4			
Hopkins mine	S. W. Hopkins	150	1	1	4	6			
Horton, C. E.	Davis, Johnson & Deering	50	1	1	2	9			
Horton, C. E.	Deering & Johnson	125	1	1	2	6			
Hudson mine	Hudson & Co.	125	1	1	10	1			
Irish & Morse	R. E. Allen	109	1	1	5	2			
Johnson mine	J. B. Johnson	90	1	1	3				
Jones mine	C. S. Jones	90	1	1	2	6			
Kinkaid, Joseph	Pryor & Bender	120	1	1	2	6			
Lewis mine	John Gerod	150	1	1	10				
Lindsey mine	John Lindsey	30	1	1	3				
Manchester mine	Thos. Manchester & Son	100	1	70	2	4			
March mine	John March	90	1		4	6			
Martin, G-e & Ferguson	Martin, Gee & Ferguson	205	1		4	1			
Morgan mine, J. C.	J. C. Morgan	50	1		3	6			
Peeler mine	D. D. Peeler	170	1	1	5				
Pearson mine	Peter Pearson	248	1	1	5	6			
Raney & Washburn	Raney & Washburn	150	1	45	3	1			
Rankin Bros	J. C. Rankin	60	1		2	10			
Rich Hill C. & M. Co., No. 2	Rich Hill C. & M. Co.	14	1		32	4			
" " " 4	" " " 4	198	1		4	1			
" " " 13	" " " 13	12	1		60	4			
" " " 15	" " " 15	125	1		106	4			
" " " 18	" " " 18	128	1		4	1			
Skillman mine	Andrew Skillman	90	1	1	3				
Sullivan mine	Wm. Sullivan	208	1		4	4			
Thomas, J. P.	H. P. Hensley	60	1		3	4			
Walnut Land Coal Co.	W. G. Hoff	69	1	1	3				
Western Coal Mining Co.	F. M. Bear	75	1		2	10			
Wilson mine	Thos. Wilson	90	1	1	3				
Wise	J. M. Wise	225	1		4	1			
Russell	M. Russell	90	1	1	3				
Thurman	E. H. Thurman	80	1	1	2	6			
Totals		510	10	825		611	1		

BOONE

Blackfoot Coal Co.	J. H. Keen	125	1		118	4		1	
Carter mine	Smith & Carter	130	1		40	3		1	
Columbia Coal Co.	E. L. Hubbard	150	1		112	3		1	
Davis mine	Isaac Davis	90	1		3			1	
Gordon mine	S. D. Gordon	90	1		2	6		1	
Gossett mine	John F. Gossett	60	1		2	6		1	
Johnson, F. M.	J. M. Rouse	140	1		3	4		1	
Rogers, Henry	Geo. Rogers	60	1	18	2	6		1	
Sims, M. J.	M. J. Sims	5	1	1	4				
Sivham mine	W. A. Siddham	30	1		3	10			
Stone, Jas. W.	James W. Stone	30	1		3				
Rees, Thomas	Thomas Rees	90	1		2	6		1	
Totals		4	3	2	3			5	4

COAL MINES—Continued.

COUNTY.

How venti- lated.	Diameter of fan, feet	Pl'n	Powder used.	No. of mules.	Employees.						Price paid for mining.		Tons of coal mined.	Price per ton of coal received at mine.	Total amount received for product of the year ending June 30, 1894		
					Miners.		Others.		Total		Summer	Winter.					
			Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Summer.	Winter.							
Natural.			Cost		Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Co op	tive					
1	1	1	35	59	1	1	5	5	7	9	6	65	65	8,000	\$1 25	\$10,000	
1	1	1	80	1,120	2	2	25	25	1	8	33	50	50	300	1 20	360	
			45	90			2	2	2	2	2			750	1 12½	844	
							1	1	1	1	1			9,000	1 05	9,450	
							2	2	5	5	7	7		500	1 20	600	
							6	6	1	1	7	7		200	1 00	200	
			51	89	1	1	2	2	2	2	7	7		1,500	1 25	1,875	
									2	2				1,020	1 25	1,275	
									5	5				450	1 25	562	
			20	37					5	5				1,080	1 25	1,350	
			14	28					2	2				500	1 12½	565	
			23	36			1	1	1	2				1,000	1 00	1,000	
			20	38					10	10				1,800	1 15	2,070	
			40	60			10	10	10	20				10,000	1 12½	11,250	
			31	55	1	1	4	4	1	5	5	75	75	800	1 16	927	
							2	2	7	9				3,646	1 20	4,875	
									2	2	2			600	1 12½	675	
			10	17					4	4	4			300	1 12½	337	
									5	5	5			2,000	1 00	2,000	
									2	2	2			2,000	1 12½	2,250	
									2	2	5			120	1 00	120	
									2	2				520	1 45	650	
									2	2				260	1 25	325	
			8	14			3	3	2	2				80			
			600	1,200	3	3	15	15	5	5	20	20	50	50	12,300	1 15	14,145
							1	1	3	3	4	4		486	1 12½	547	
							8	8	30	6	33	7		1,400	1 25	1,750	
			56	98			4	4	2	2	6	6	75	75	2,064	1 12½	2,322
			150	277			12	12	1	1	13	1		80	75		
														60	55		
														3	75	75	
														7	69	69	
														50	36	69	
														50	50		
														69	69		
														51½	51½		
														50	50		
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COUNTY.

1	1	1	75	131		10	4	2	1	12	5	87½	87½	3,200	1 50	4,800
1	1	1	80	140		10	5	2	2	12	7	87½	87½	3,600	1 50	5,400
1	1	1			2	25	20	5	5	30	25	80	80	8,800	1 50	13,200
1	1	1				3				3		87½		498	1 25	627
1	1	1				8		1		9		87½		1,000	1 20	1,200
1	1	1	3	6		1				1		1 00		100	1 25	125
1	1	1	35	70	1	5		1		6		87½		1,120	1 85	2,060
1	1	1	12	24		2				3		85		280	1 50	420
								3		3				50	1 25	63
										2				100	1 50	150
										1				50	1 25	63
										2				50	1 25	63
										1				240	1 25	300
2	7	1	8	209	379	8	2	66	29	15	11	81	40	10,038		28,428

STATISTICS OF

CALDWELL

Name of company.	Operator.	No. of days worked.	Kind of opening.		Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.		
			Slope	Drift		Feet	Inches	Steam	Hand	Al- ternate
Caldwell Coal Co	Caldwell Coal Co.	218	1		365	1	6	1		
Cowgill	Cowgill ..	120	1		350	1	10	1		
Hamilton ..	Hamilton ..	160	1		300	1	10	1		
Kingston ..	Kingston ..	203	1		242	1	8			
Totals			4					4		

CALLAWAY

Bishop mine	Bishop & Cumberland ..	200	1			2		1		
Carbon Valley mine	Flowers & Simmons ..	250		1		2	6		1	
Castle mine	Wm. Castle ..	230		1		2	4		1	
Criwell, W.	R. M. Henderson	50		1		2			1	
Curd, E. D.	F. Lamferous	125		1		2	6		1	
Curt mine	Edward Curd	140		1		1	10		1	
Fulton Fire-brick & Mining Co.	Fulton F. B. & M. Co.	250	1		100	2	6	1		
Harris mine	John Harris	192	1		40	2	6		1	
Henderson, J. S.	Wm. Allen & Son	160	1		25	9			1	
Marsenkoff mine	John Marsenkoff	208	1		50		8		1	
Smith mine	James Smith	150		1			8		1	
Weeks mine	John Littel	120		1			6		1	
Totals			4	3	5			1	5	6

CARROLL

Farr mine	Ralph Farr ..	200			1	2				
Wallace Preston	Geo. Williams ..	90	1		18	1	6		1	
Totals			1		1				1	

CEDAR

Davis mine	A. B. Davis	60		1		2	4		1	
Duncan mine	J. C. Duncan	60		1		2			1	
Poage mine	G. M. Poage	100		1		2	2		1	
Totals				3					3	

CHARITON

Huenten, John	R. Brewer	90		1		1	6		1	
Iale mine	E. W. Iale	20		1		1	4		1	
Totals				1	1				1	1

CLAY

North Kansas City C. & M. Co. ..	North K. C. C. & M. Co. ..	170	1			485	1	10	1	
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COAL MINES--Continued.

COUNTY.

How venti- lated.	Diameter of fan, feet	Pl'n	Powder used.		No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal received at mine ..	Total amount received for product of the year ending June 30, 1894		
						Miners.			Others.		Total.							
						Winter..	Summer..	Winter..	Summer..	Winter..	Summer..	Winter..	Summer..					
Natural..	10	Pillar & R Long-wall	Cost	Number of k-egs....	Summer. Winter..	2	2	48	25	10	9	58	84	1 12½	1 00	9,969	1 65	16,483
Furnace	10	.....	.....	.....	Summer. Winter..	5	4	5	5	1	1	6	6	1 50	1 50	600	2 00	1,200
.....	10	.....	.....	.....	Summer. Winter..	5	4	40	20	8	5	48	25	87½	75	8,061	1 80	15,525
.....	8½	.....	.....	.....	Summer. Winter..	7	6	24	12	6	4	30	16	1 12½	1 12½	4,219	1 94	7,811
.....	2	4	.....	.....	Summer. Winter..	7	6	112	62	25	19	187	81	.....	.....	22,869	.....	41,018

COUNTY.

1	1	1	.....	3	2	.....	3	2	1 00	1 00	1,000	1 50	1,500	
1	1	1	.....	4	2	.....	4	2	1 12½	1 12½	1,582	1 99	3,148	
1	1	1	.....	3	2	.....	3	2	1 10	1 10	1,244	1 50	1,866	
1	1	1	.....	1	.....	.....	1	.....	1 25	.....	80	2 00	160
1	1	1	.....	2	.....	.....	2	.....	1 00	.....	600	1 50	900
1	1	1	.....	5	.....	.....	7	.....	1 06¼	.....	1,609	1 69	2,715
1	1	1	.....	40	20	5	4	45	24	1 00	12,000	1 55	18,600		
1	1	1	.....	6	6	1	1	7	7	1 00	1,840	1 50	2,760		
1	1	1	.....	5	2	1	.....	6	2	1 00	793	1 75	1,260	
1	1	1	.....	2	1	1	.....	3	1	1 00	560	1 50	840	
1	1	1	.....	8	.....	.....	9	.....	1 00	.....	1,765	1 50	2,647
1	1	1	.....	1	.....	.....	2	.....	1 00	.....	150	2 00	300
6	6	7	5	1	80	35	12	5	92	40	23,223	1 57	36,636

COUNTY.

1	1	1	.....	2	1	.....	2	1	.....	.....	800	1 75	1,400
1	1	1	.....	1	.....	.....	1	.....	1 00	.....	120	1 66	200
1	1	1	.....	3	1	.....	3	1	.....	.....	920	.....	1,600

COUNTY.

1	1	1	.....	3	.....	1	.....	4	.....	1 00	.....	333	1 50	500
1	1	1	.....	1	.....	.....	.....	1	.....	1 00	.....	97	1 50	146
1	1	1	.....	2	1	.....	.....	2	1	1 00	75	300	1 50	450
3	3	3	.....	6	1	1	.....	7	1	.....	.....	780	.....	1,096

COUNTY.

1	1	1	.....	2	.....	.....	2	.....	1 00	.....	150	2 25	337
1	1	1	1	1	35	2 00	70
1	1	1	3	3	185	407

COUNTY.

1	1	1	45	40	13	11	58	51	1 12½	1 12½	19,371	1 60	30,936
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STATISTICS OF

COLE

Name of company.	Operator.	No. of days worked.	Kind of opening.		Depth of shaft—feet.	Thick-ness of coal.		Power employed.		
			Shaft.	Slope.		Feet.	Inches.	Steam.	Hand.	Electricity.
Leach, Geo. H.	Geo. H. Leach	170	1		170	1-20				

COOPER

Hazell Springs Coal Co.	Chas. W. Hazell	60		1		1				
Jenkins mine	H. W. Jenkins	90		1		1				
Missouri Valley Coal & M. Co.	Missouri V. C. & M. Co.	130	1		96	1		2		
Stanley Coal Co.	Stanley Coal Co.	90		1		6				
Totals			1	2	1			1	2	

DADE

Clayton, W. R.	R. M. Sharp	90	1			2			1	
McCluey mine	Robt. McCluey	120	1			2		4	1	
McCombs mine	O. P. Ramsey	30	1			2		6	1	
McGarvey's mine	Thos. Allen	70	1			2		4	1	
Seaton's mine	W. E. Seaton	90		1		2		9	1	
Totals			4	1				4	1	

HENRY

Avery, A. C.	Stockton Bros	192	1		36	2		2	1	
Ballanger, Sam'l	B. W. Huey	120	1			3		2	1	
Beedy mine	W. E. Hughes	205	1		17	4		6	1	
Blanchard mine	D. C. Blanchard & Sons	160	1		40	3		2	1	
Brown Coal Co.	Edward Brown	115	1		50	3		4	1	
Central Coal and Coke Co.	Central Coal and Coke Co	149	1		60	2		6	1	
Co-operative Coal Co.	Co-operative Coal Co.	180	1		76	2		8	1	
Colorado Blair mine	Hunt, McFadden & Co.	20	1		32	3		1		
England mine	Wm. England	50	1		25	2		8	1	
Gedney	A. P. Fonda Est	160	1		32	2		6	1	
Geahart	Theodore Geahart	175		1		4				
Gibbs	Henry Gibbs	30		1		1		3		
Griffin, John B.	T. P. Hunt	70		1		1		8		
Hines, F. B.	J. W. Shook	203	1		40	4		10	1	
Hurst mine No. 1	Wm. Hurst	120	1			3		3		
Hurst, John	John Hurst	125	1		35	3			1	
Hurst, J. W.	J. W. Hurst	45	1		25	2		9		
McCardell mine	John McCardell	85	1		33	3			1	
McCloud mine	Alex. McCloud	160	1		32				1	
McFadden mine	McFadden & Co	120	1			3			1	
Mann, James	John W. Martin	60	1					6		
Miller, W. J.	L. W. Beaman	205	1			5		8	1	
North Clinton Coal Co.	North Clinton Coal Co	160	1		50			6	1	
Owens mine	B. L. Owens	110	1			2			1	
Parks mine	Bert Carpenter	30	1			3			1	
Pigg, D. B.	D. B. Pigg	80	1					6		
Reese mine	Wm. Reese	145	1			3			1	
Rusk mine	Wm. Rusk	250	1		40			3	1	
Schlicker, W.	John Addell	60	1		40	2		6	1	
Stephens mine	Henry Stephens	200		1		3			1	
Stewart mine	W. H. Stewart	1		1		1		3		
Terrill, R.	Michaels & Sheridan	100	1		21	3		3	1	
Thompson mine	R. L. Thompson	120	1		47	3		4	1	
Tyler estate	Not operating June 30, '94	120	1		35				1	
Victor, S. M.	Keller & McKeal	35		1		1		10		
Totals			21	8	2	4		6	16	9

COAL MINES—Continued.

COUNTY.

How ventilated.	Diameter of fan, feet.	Pl'n	Powder used.		No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal received at mine...	Total amount received for product of the year ending June 30, 1881.....
			Number of kegs...	Cost		Miners.	Others.	Total.	Winter ..	Summer ..	Winter ..	Summer ..	Winter ..			
1	...	1	75	140	...	4	4	2	2	6	6	.....	.....	2,000	1 50	3,000

COUNTY.

1	...	1	...	...	...	2	2	2	1	4	3	1 50	1 37½	478	2 00	946
1	...	1	...	...	...	1	...	1	...	2	...	1 50	...	150	2 00	500
1	...	1	...	...	...	6	3	2	1	8	4	75	75	1,116	2 00	2,232
...	...	...	...	...	...	...	4	...	...	...	4	...	...	900	2 00	1,800
3	...	1	2	...	...	9	9	5	2	14	11	...	...	2,639	.....	5,278

COUNTY.

1	1	1	1	1	1	7	2	7	2	1 00	1 00	1,050	1 50	1,576	
1	1	1	1	1	3	1	4	1	25	720	1 50	1,080	86		
1	1	1	1	1	1	1	1	1	1 00	1 00	57	1 50	86		
1	1	1	1	1	2	1	2	1	4	2	1 00	1 00	300	1 50	450
1	1	1	1	1	2	1	2	1	4	2	1 00	1 00	200	1 50	300
5	5	5	5	5	14	5	3	1	17	6	.....	.....	2,327	.....	3,492

COUNTY.

1	1	1	172	301	6	4	1	1	7	5	1 00	1 00	720	2 00	1,440		
			144	230	6	4	1	1	7	4	90	80					
											62½	62½	1,500	1 50	2,250		
1	1	1	22	44	6	1	2	1	8	2	75	75	1,033	1 75	1,808		
			280	448	15	3	5	1	20	4	1 00	90	3,786	1 50	5,679		
			7	150	8	4	2	1	10	5	1 00	90	1,090	1 37½	1,498		
			1,035	2,070	5	4	50	43	28	78	65	85	75	26,604	1 50	39,906	
			60	102			20	10	4	24	14	70	70	4,680	1 25	5,850	
			16	28			12				17	90	90	320	1 50	480	
1	1	1	4	7	1				2	2	1 00	...	150	1 50	225		
			7	12	1	1	20	10	6	6	26	16	70	3,515	1 32	4,640	
			40	70			6	6			6	60	60	2,600	1 25	3,250	
									1	1				55	2 00	110	
1	1	1					2	1	1	2	1	1 25	1 25	169	1 75	285	
			40	76			8	4	1	1	9	5	75	62½	1,040	1 50	1,560
1	1	1	60	105			5		1	1	6		90	929	1 25	1,162	
			75	131			10	4	1	1	11	6	90	2,200	1 50	3,300	
1	1	1	5	8			2						80	97	1 50	145	
1	1	1	25	50			6		1		7		90	950	1 50	1,425	
1	1	1	20	35			2	2	1	1	3	3	1 25	1 12½	400	1 90	760
1	1	1	125	250			10		1		11		90	2,500	1 50	3,750	
							2				2		75	100	1 50	150	
			65	125			7	3	4	2	11	5	62½	62½	2,818	1 50	3,478
							15	15	3	3	18	18	90	4,700	1 37½	6,462	
1	1	1					3			3			1 25	655	2 00	1,310	
1	1	1					2			2			70	60	1 75	105	
1	1	1	70	175			15	15	4	4	19	19	70	2,200	1 25	2,750	
1	1	1	40	80			3	2	1	1	4	3	90	720	1 50	1,080	
1	1	1					2	1	1		3	1	90	540	1 75	945	
1	1	1	3	6			2				2	1	100	115	1 37½	160	
1	1	1	100	200			8	2	1		9	2	90	75	4,000	1 25	5,000
							2		2		4			500	1 75	875	
1	1	1	200	400			20	6	2	26	2	95	85	4,000	1 50	6,000	
1	1	1	400	800			50	30	5	3	55	33	95	9,600	1 37½	13,152	
1	1	1	20	30			3		1		4	1	100	502	1 75	878	
							2			2				125	1 50	190	
14	12	5	6	25	3,103	5,933	6	6	318	176	86	59	404	235	84,473
															1 44	...	122,038

STATISTICS OF

LAFAYETTE

Name of company.	Operator.	No. of days worked.	Kind of opening.			Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.	
			Shaft.	Slope.	Strip-pit.		Feet.	Inches.	Steam.	Hand.
Bell & Greer	W. H. Greer	200	1	1		1	8		1	1
Bonanza Coal Co	J. B. Brandin	165	1			70	8		1	
Brackman, Henry W.	Dorham & Lofrenz	200	1			41	8		1	
Bruce & Knoble	L. P. Knoble	95	1			45	5		1	
Carter, Andrew	A. Carter & Son	100	1	1		1	6		1	
Coleman mine	Frank Coleman	130	1			1	6		1	
Consolidated Farmers' Coal Co.	Rocky Branch Coal Co.	112	1	1		1	6		1	
Corder Coal & Coke Co.	Corder Coal & Coke Co.	200	1			100	6	1		
Datsev H II Coal Co.	W. H. Bell	90	1			25	8		1	
DeBolt mine	J. H. DeBolt	77	1	1		1	6		1	
Dover mines	Dover Coal Co.	110	1	1		2			1	
Duncan mines	Chas. E. Duncan	180	1	1		1	6		1	
Excelsior Coal & Coke Co.	Excelsior Coal & Coke Co.	180	1			70	5	1		
Farmers' Coal & Mining Co.	Beatty, James & Campbell	180	1			40	5		1	
Fox mine	N. F. Fox	175	1			40	4		1	
Haygood Coal Co.	Gunn Bros	195	1			18	6		1	
Hawkins & Smith	J. E. Wilkes	128	1			72	8		1	
Hepner, F.	A. C. Lee	80	1	1		1	9		1	
Holwell mine	M. Holwell	95	1			60	6		1	
Hoppyville mine	J. Wiatt Lewis	150	1			20	10		1	
Kelst, Joseph	P. McDonnell	15	1			1	6		1	
Kreltz, Fred	John Clotten	90	1	1		1	4		1	
Kresse mine	A. F. Kresse	87	1			20	9		1	
Lafayette Coal Co.	Lafayette Coal Co.	157	1	1		2			1	
Lexington Coal & Mining Co.	Lexington C. & M. Co.	165	1			42	2		1	
McDowell mine	"	154	1	1		2			1	
No. 1 Riverton mine	"	183	1			1	8		1	
Hackett mine	"	228	1	1		1	8	1		1
Grady mine	"	151	1			28	6		1	
Hartman mine	"	180	1	1		1	6		1	
McGrew mine	J. C. McGrew	150	1	1		1	10		1	
Macey mine	Henry Macey	182	1			60	6		1	
Melnerhagen, Fritz	Frank Koester	100	1	1		1	6		1	
Morgan, W. P.	W. P. Morgan	180	1	1		1	10		1	
Morrison Bros.	Morrison Bros.	100	1	1		22	6		1	
O'Malley mine	Andrew O'Malley	85	1	1		1	4		1	
O'Malley, J. J.	J. J. O'Malley	90	1	1		1	7		1	
Parady mine	Alex Parady	60	1			24	6		1	
Radd mine	Wm Radd	90	1			60	6		1	
Riely & Kelst	Riely & Kelst	100	1			34	4		1	
St. Clair mine	Harry St. Clair	147	1			45	7		1	
Salt Fork Coal and Mining Co.	Salt Fork C. & M. Co.	80	1			40	10		1	
Seawell & Co.	J. M. Seawell & Co.	158	1			100	5	1		
Strausburg mine	The Mathews Coal Co.	166	1			20	6		1	
Stealey & Fowler Coal Co.	Stealey & Fowler C. Co.	150	1	1		2	2		1	
Summers mine	M. W. Summers	90	1	1		2			1	
Steinman, Henry	Henry Bariels	75	1			1	8		1	
Taggart, J. A.	Thos. Walworth	190	1			60	10		1	
Mo. Coal Co. (Brown & Bowers)	Missouri Coal and M. Co.	111	1			110	7		1	
The Southwestern Coal Co.	The Southwestern C. Co.	50	1	1		1	6		1	
Valentine mine	John Valentine	100	1	1		1	10		1	
Walnut Grove mine	J. P. Hendrix	240	1	1		1	6		1	
Walton, Thomas	Thomas Walton	115	1			100	3	6	1	
Waverly Coal and Mining Co.	Waverly Coal & M. Co.	200	1			38	5		1	
Wellington Coal Co.	Wellington Coal Co.	124	1			45	6		1	
Y. S. A. Coal Co.	Y. S. A. Coal Co.									
Totals		29	6	20			10	24	21	1

COAL MINES—Continued.

COUNTY.

How venti- lated	Diameter of fan, feet	Pl'n	Powder used.		No. of mules.	Employees.						Price paid for mining		Tons of coal mined..	Price per ton of coal at mine.....	Total amount received for product of the year ending June 30, 1894		
						Miners.			Others.								Total.	
			Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter				Summer	
Natural.	Fan	Long-wall	Pillar & R	Number of Kegs.	Cost													
1	1	1	1														4,000	
1	1	1	1														16,000	
1	1	1	1														1,900	
1	1	1	1														5,005	
1	1	1	1														844	
1	1	1	1														843	
1	1	1	1														10,000	
1	1	1	1														28,000	
1	1	1	1														1,050	
1	1	1	1														263	
1	1	1	1														5,600	
1	1	1	1														1,075	
1	1	1	1														28,000	
1	1	1	1														19,575	
1	1	1	1														1,084	
1	1	1	1														5,687	
1	1	1	1														3,665	
1	1	1	1														437	
1	1	1	1														1,328	
1	1	1	1														1,400	
1	1	1	1														105	
1	1	1	1														400	
1	1	1	1														150	
1	1	1	1														20,100	
1	1	1	1														48,859	
1	1	1	1														47,583	
1	1	1	1														13,377	
1	1	1	1														34,045	
1	1	1	1														9,075	
1	1	1	1														33,569	
1	1	1	1														14,000	
1	1	1	1														2,156	
1	1	1	1														420	
1	1	1	1														4,274	
1	1	1	1														825	
1	1	1	1														168	
1	1	1	1														540	
1	1	1	1														300	
1	1	1	1														495	
1	1	1	1														256	
1	1	1	1														5,470	
1	1	1	1														4,290	
1	1	1	1														15,275	
1	1	1	1														18,750	
1	1	1	1														2,300	
1	1	1	1														356	
1	1	1	1														525	
1	1	1	1														9,800	
1	1	1	1														7,000	
1	1	1	1														150	
1	1	1	1														210	
1	1	1	1														4,430	
1	1	1	1														1,521	
1	1	1	1														6,200	
1	1	1	1														14,769	
18	32	5	52	3	70	\$115	35	27	1297	751	192	139	1491	890		299,931	1 52	\$457,457

STATISTICS OF

LAFAYETTE

Name of company.	Operator.	No. of days worked.	Kind of opening.			Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.			
			Shaft	Slope	Strip-pit		Feet	Inches	Steam	Horse	Electricity	Art.
Bell & Greer	W. H. Greer	200	1	1			1	8		1		
Bonanza Coal Co	J. B. Brandin	165	1			70	1	8		1		
Brackman, Henry W.	Dorham & Lofrenz	200	1			41	1	8		1		
Bruce & Knoble	L. P. Knoble	93	1			45	1	5		1		
Carter, Andrew	A. Carter & Son	100		1			1	6		1		
Coleman mine	Frank Coleman	150		1			1	6		1		
Consolidated Farmers' Coal Co.	Rocky Branch Coal Co.	112		1			1	6		1		
Corder Coal & Coke Co	Corder Coal & Coke Co	900	1			100	1	6		1		
Daisey H. L. Coal Co.	W. H. Bell	90	1			25	1	8		1		
DeBolt mine	J. H. DeBolt	77		1			1	6		1		
Dover mines	Dover Coal Co.	110		1			2			1		
Duncan mines	Chas. E. Duncan	160		1			1	6		1		
Excelsior Coal & Coke Co	Excelsior Coal & Coke Co	180	1			70	1	5		1		
Farmers' Coal & Mining Co.	Beatty, James & Campbell	180	1			40	1	5		1		
Fox mine	N. F. Fox	175	1			40	1	4		1		
Haygood Coal Co	Gunn Bros	195	1			18	1	6		1		
Hawkins & Smith	J. E. Wilkes	128	1			72	1	8		1		
Hepner, F.	A. C. Lee	80		1			1	9		1		
Holwell mine	M. Holwell	95	1			60	1	6		1		
Hoppyville mine	J. Watt Lewis	150	1			20	1	10		1		
Keist, Joseph	P. McDonnell	15		1			1	6		1		
Kreitz, Fred	John Clotten	90		1			1	4		1		
Kresse mine	A. F. Kresse	87	1			20	1	9		1		
Lafayette Coal Co.	Lafayette Coal Co.	157		1			2			1		
Lexington Coal & Mining Co.	Lexington C. & M. Co.	165	1			42	2			1		
McDowell mine	"	154		1			2			1		
No. 1 Riverton mine	"	153		1				8		1		
Hackett mine	"	228		1			1	8		1		
Grady mine	"	151	1			28	1	8		1		
Hartman mine	"	180		1			1	6		1		
McGrew mine	J. C. McGrew	150		1			1	6		1		
Macey mine	Henry Macey	182	1			60	1	10		1		
Melnerhagen, Fritz	Frank Koester	100		1			1	8		1		
Morgan, W. P.	W. P. Morgan	180		1			1	6		1		
Morrison Bros.	Morrison Bros.	100	1			22	1	6		1		
O'Malley mine	Andrew O'Malley	85		1			1	4		1		
O'Malley, J. J.	J. J. O'Malley	90		1			1	7		1		
Parady mine	Alex Parady	60		1		24	2	6		1		
Radd mine	Wm. Radd	90	1			60	1	6		1		
Riely & Keist	Riely & Keist	100	1			34	1	4		1		
St. Clair mine	Harry St. Clair	147	1			45	1	7		1		
Salt Fork Coal and Mining Co.	Salt Fork C. & M. Co.	80	1			40	1	10		1		
Seawell & Co.	J. M. Seawell & Co.	158	1			100	1	5		1		
Strausburg mine	The Mathews Coal Co.	166	1			20	1	6		1		
Stealey & Fowler Coal Co.	Stealey & Fowler C. Co.	150		1			2	2		1		
Summers mine	M. W. Summers	90		1			2			1		
Steinman, Henry	Henry Bartels	75		1			1	8		1		
Taggart, J. A.	Thos. Walworth	150	1			60	1	10		1		
Mo. Coal Co. (Brown & Bowers)	Missouri Coal and M. Co.	111	1			110	1	7		1		
The Southwestern Coal Co.	The Southwestern C. Co.	60		1			1	6		1		
Valentine mine	John Valentine	100		1			1	10		1		
Walnut Grove mine	J. P. Hendrix	240		1			1	6		1		
Walton, Thomas	Thomas Walton	115	1			100	3	6		1		
Waverly Coal and Mining Co.	Waverly Coal & M. Co.	260	1				1	6		1		
Wellington Coal Co.	Wellington Coal Co.	124	1			45	1	6		1		
Y. S. A. Coal Co.	Y. S. A. Coal Co.											
Totals		29	6	20					10	24	21	1

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COUNTY.

How venti- lated	Diameter of fan, feet	Pl'n	Powder used.	No. of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal at mine.....	Total amount received for product of the year ending June 30, 1884	Total amount received for product of the year ending June 30, 1884			
					Miners.			Others.			Total.	Winter.					Summer.	Winter.	Summer.
					Winter.	Summer.	Winter.	Summer.	Winter.	Summer.									
1	1	1				8	8		2	50	8	1 25	1 12 1/2	2,800	1 40	4,000	4,000		
1	1	1				50	50				7 1 00	87 3/4		2,800	1 81	16,000	16,000		
1	1	1				3	3		1	3	1 25	1 25		950	2 00	1,900	1,900		
1	1	1				20	20		20	20	1 00			2,860	1 75	5,005	5,005		
1	1	1				2	2		1	3	1 00	1 00		422	2 00	844	844		
1	1	1				2	2		2	2	1 12 1/2			452	1 75	843	843		
1	1	1				40	40		3	45	1 00			6,272	1 60	10,000	10,000		
1	1	1				55	55		5	62	1 00	87 3/4		19,048	1 47	28,000	28,000		
1	1	1				5	5		2	50	1 00			600	1 75	1,050	1,050		
1	1	1				2	2		2	2	1 20			162	1 62 1/2	1,263	1,263		
1	1	1				25	25		2	27	1 12 1/2	1 00		4,000	1 40	5,600	5,600		
1	1	1				8	8		1	4	1 12 1/2	87 3/4		662	1 62 1/2	1,075	1,075		
1	1	1				85	85		10	95	1 12 1/2	87 3/4		15,757	1 75	28,000	28,000		
1	1	1				45	45		7	52	2 12 1/2	87 3/4		10,440	1 87 1/2	19,575	19,575		
1	1	1				3	3		2	32	1 25	1 25		517	2 00	1,084	1,084		
1	1	1				16	16		2	17	1 12 1/2	1 00		3,500	1 62 1/2	5,687	5,687		
1	1	1				8	8		1	9	1 12 1/2	87 3/4		1,960	1 87 1/2	3,965	3,965		
1	1	1				2	2			2	1 00			250	1 75	437	437		
1	1	1				5	5		1	6	1 25 1/2			800	1 66	1,328	1,328		
1	1	1				4	4		1	5	1 00	80		1,000	1 40	1,400	1,400		
1	1	1				2	2			2	1 12 1/2			60	1 75	105	105		
1	1	1				2	2			2	1 00			200	2 00	400	400		
1	1	1				2	2		1	3	1 12 1/2			90	1 70	150	150		
1	1	1				70	70		35	4	1 12 1/2	1 00		14,800	1 40	20,100	20,100		
1	1	1				90	90		16	106	1 12 1/2	1 00		35,368	1 38	48,850	48,850		
1	1	1				104	104		17	122	1 12 1/2	1 00		34 772	1 37	47,583	47,583		
1	1	1				4	4		9	56	1 12 1/2	1 00		9,909	1 35	13,377	13,377		
1	1	1				5	5		39	36	1 00	50		24 351	1 40	34,045	34,045		
1	1	1				82	82		5	4	37	30	1 12 1/2	1 00	6 347	1 43	9,075	9,075	
1	1	1				2	2		30	130	33	1 12 1/2	1 00	20,560	1 58	33,599	33,599		
1	1	1				2	2		4	4	64	34	1 12 1/2	1 00	10,440	1 34	14,000	14,000	
1	1	1				3	3			4	8	1 12 1/2	87 3/4	1,150	1 87 1/2	2,156	2,156		
1	1	1				1	1			2	1 12 1/2	1 12 1/2		240	1 75	420	420		
1	1	1				8	8		3	8	1 25	1 12 1/2		2,011	2 12 1/2	4,274	4,274		
1	1	1				3	3			3	1 12 1/2			600	1 37 1/2	825	825		
1	1	1				1	1			1	1 25			96	1 75	168	168		
1	1	1				2	2		1	3	1 25			300	1 80	540	540		
1	1	1				2	2		1	3	1 25			150	2 00	300	300		
1	1	1				4	4		1	5	1 10	1 10		300	1 65	495	495		
1	1	1				1	1			1	1 25			128	2 00	256	256		
1	1	1				18	18		3	21	14	1 06 1/2	87 3/4	3,465	1 57	5,470	5,470		
1	1	1				20	20			22		1 12 1/2		2,860	1 50	4,290	4,290		
1	1	1				40	40		7	47	30	1 12 1/2	87 3/4	8,541	1 79	15,275	15,275		
1	1	1				85	85		8	2	48	22	1 00	10,000	1 87 1/2	18,750	18,750		
1	1	1				4	4			4	11	1 25	1 25	1,150	2 00	2,300	2,300		
1	1	1				2	2			2	1 12 1/2			200	1 75	356	356		
1	1	1				3	3			3	1 00			300	1 75	525	525		
1	1	1				40	40		4	2	44	22	1 12 1/2	7,000	1 40	9,800	9,800		
1	1	1				25	25		12	25	12	1 12 1/2	1 00	5,000	1 40	7,000	7,000		
1	1	1				1	1			1	65			100	1 50	150	150		
1	1	1				2	2		1	2	1 12 1/2	1 12 1/2		120	1 75	210	210		
1	1	1				9	9		2	11	8	1 25	1 12 1/2	2,720	1 62 1/2	4,430	4,430		
1	1	1				10	10		1	11	6	56		1,521	1 00	1,521	1,521		
1	1	1				30	30		15	33	17	1 12 1/2	1 00	4,000	1 55	6,200	6,200		
1	1	1				60	60		30	8	75	38	1 12 1/2	8 800	1 68	14,789	14,789		
18	32	5	52	3	70	\$115	35	27	1297	751	192	139	1491	890	299,931	1 52	\$457,457	\$457,457	

Fisher, R. C.	Thos. Seran.	120	1	2	1
Gregg, G. W.	A. Carson	200	1	32	2
Totals			1	1	1

COAL MINES—Continued.

COUNTY.

How ventilated.	Diameter of fan, feet	Pl'n	Powder used.	No of mules.	Employees.						Price paid for mining		Tons of coal mined...	Price per ton of coal at mine	Total amount received for product of the year ending June 30, 1904		
					Miners.			Others			Total.	Summer.				Winter.	
					Winter.	Summer.	Winter.	Summer.	Winter.	Summer.							
Natural.	Fan.	Long-wall	Number of kegs	Cost	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.	Winter.	Summer.					
1	110	1			10	8	140	100	25	20	165	120	50	50	75,000	1 75	247
1	112	1	2,869	5,738	8	8	137	145	32	33	169	178	50	50	700	1 12½	85,000
1	110	1	3,257	6,514	17	18	231	152	55	32	290	184	50	50	68,862		1,050
1	112	1	2,995	5,990	16	18	221	144	40	36	261	180	50	50	78,898		
1	112	1	1,735	3,470	9	9	118	95	25	27	147	122	50	50	71,871		
1	110	1	200	400	3	3	20	25	4	4	24	29	50	50	41,632		
1	110	1	160	320	2	2	10	10			10	10	50	50	5,017	1 00	283,931
1	110	1	160	320	2	2	10	15	4	2	22	17	50	50	3,036		
1	112	1	185	370	2	2	10	10	4	4	14	14	50	50	4,443		
1	110	1	140	280	2	2	50	15	3	3	53	18	50	50	4,786		
1	110	1	40	80			10				11		50	50	4,264		
1	112	1	500	1,000	5	5	85	85	16	16	101	101	64	60	1,122	1 20	48,000
1	110	1			8	8	48	49	23	27	72	76	50	50	40,000	1 15	80,455
1	112	1	977	1,709	9	10	76	76	36	37	112	113	50	50	28,109	1 11	38,308
1	110	1			2	2	60	17	25	8	85	25	50	60	84,649	1 15	19,939
1	110	1					1				1				17,405	1 50	60
1	110	1	8	14			2			2			1 00		40	1 50	166
1	110	1					6	5	1	1	7	6	1 00	1 25	148	1 12½	30
1	110	1					5	3			5	3	1 12½	1 12½	20	1 50	2,786
1	110	1	2	4			4				4		1 00		800	1 37½	1,100
1	110	1					3				3		1 00		200	1 50	300
1	110	1			8	6	60	50	15	12	75	62	50	50	600	1 50	750
1	110	1			2		30		8		38		50		23,000	1 17	27,000
7	7 10	4 20	13,198	\$26,149	104	102	1324	993	323	262	1647	1261	511,566	\$1 07	\$546,772

COUNTY.

1	8	1			2	40	9	49	92	12,175	1 85	16,500
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COUNTY.

1	1				9	6	9	6	2 00	2 00	1,280	2 50	3,200
1	1				3		3		2 00		120	2 75	300
1	1				4		4		2 00		364	2 50	910
1	1				4		4		2 25		400	2 75	1,100
1	1				3	1	4	1	1 25	1 00	820	2 50	2,050
4	1	4	1		23	7	24	7			2,984		7,560

COUNTY.

1	1				1	1	1	1	75	75	138	1 05	144
1	1				6	4	1	7	5	1 00	1,600	2 00	3,200
2	2				7	5	1	8	6		1,738		3,344

STATISTICS OF

PUTNAM

Name of company.	Operator.	N. of days worked.	Kind of opening.			Depth of shaft—feet.	Thick- ness of coal.		Power em- ployed.		
			Shaft	Slope	Drift		Feet	Inches	Steam	Horse	Electricity
Adkins, Wm.	Patrick Biggy	120	1			27	2	9		1	
Barnhardt mine	A. J. Barnhardt	90			1		3	7		1	
Blackbird Coal Co.	Blackbird Coal Co.	130	1			53	2	10	1		
Carter mine	J. H. Carter	105	1		1		3			1	
Henkle mine	Patterson & Boyd	110	1	1			3	4		1	
Mendota Coal and Mining Co.	Mendota C. and M. Co.	172				67	2	10	1		
"	"	172				67	2	10	1		
"	"	172	1			67	2	10	1		
Sanders, Virginia	Posey Veach	40			1		3	10		1	
Pherigo, Martin	Pherigo Bros.	35			1		3	8		1	
Totals			4	2	4				4	1	5

RANDOLPH

Breckinridge, John	John Breckinridge	170	1			90	4		1		
"	"	100	1			70	4		1		
Brown & Welsby	G. Welsby	120	1			64	3	4		1	
Caffery & Baker Coal Co.	Caffery & Baker	204		1			4	6		1	
Dean, Harry	Harry Dean	110		1			4			1	
Detienne, A. D.	A. D. Detienne	180		1			4			1	
Edwards, Emanuel	E. Edwards	176		1			4			1	
Fleming Coal Co.	Thos. Fleming	237	1			145	4		1		
Headrick mine	Jas. Headrick	120			1		4			1	
Higbee Coal and Mining Co.	Wm. Walton	125	1			175	3	8	1		
Interstate Coal and Mining Co.	Wm. Walton	66	1			110	3	8	1		
McKiernan mine	W. H. McKiernan	60			1		3	10		1	
Mathis, Mrs. C.	E. Phillips	60		1			5			1	
Mitchell mine	W. E. Mitchell & Co.	140			1		4			1	
Moberly Mutual Coal Co.	Huttcher & Young	180	1			112	3	6		1	
Milburn mine	Joseph Milburn & Sons	90	1			50	4	6		1	
Morris mine	John L. Morris	130		1			3	8		1	
Rees, Mrs.	Lamb & Baily	120		1			3	10		1	
Roebuck & Bond	S. Skinner	160			1		4			1	
Skinner, John	Wm. Miller	110			1		4			1	
Stewart mine	J. N. Stewart	97			1		4			1	
Strief mine	Michael Strief	200			1		4			1	
The Eagle Coal Co.	The Eagle Coal Co.	165	1			125	3	9	1		
Vaughn mine	Wm. Vaughn	90			1		4	6		1	
Ward mine	Edward Ward	120	1			88	3	10		1	
Went, A. G.	Wm. Brannon	100			1		4			1	
Williams, J. B.	L. B. Williams	105	1			96	4	2		1	
Totals			11	3	15				6	8	15

COAL MINES—Continued.

COUNTY.

How venti- lated	Diameter of fan	Pl'n	Powder used.		No. of mules.		Employees.				Price paid for mining		Tons of coal mined..	Price per ton of coal received at mine ...	Total amount received for product of the year ending June 30, 1894
							Miners.	Others.	Total.						
Natural.	Fan.	Long-wall	Number of kegs....	Cost	Winter...	Summer.	Winter...	Summer.	Winter...	Summer.	Winter...	Summer.			
1	1	1	1				5	1	6	87½			800	1 25	\$1,000
1	1	1	1				35	25	60	80			200	1 25	250
1	1	1	1		3	3	35	5	40	80	80		8,645	1 50	18,070
1	1	1	1				3	2	5	87½			500	1 25	625
1	1	1	1				3		3	90	70		608	1 25	769
1	1	1	1		17	15	434	371	76	79	510	450	108,922	1 30	141,768
1	1	1	1				2		2	80			90	1 25	120
1	1	1	1				2		2	87½			67	1 25	84
6	3	1	3	7	20	18	488	398	82	82	570	480	119,832		156,677

COUNTY.

1	1	1	1	880	\$1,760	4	3	80	50	20	15	100	65	60	50	22,606	85	\$19,215
1	1	1	1	381	762	4	3	65	45	18	13	83	58	60	50	11,424	85	9,711
1	1	1	1					5	1			6		85		1,209	\$1 25	1,500
1	1	1	1	1,750	3,410	12	10	130	90	30	20	160	110	50	50	55,000	1 90	50,000
1	1	1	1	40	70			2	1			2	1	75	75	533	1 50	800
1	1	1	1	24	56	1	1	3	1	2	1	5	2	70	70	1,000	1 25	1,250
1	1	1	1	15	53			2	1	1	1	3	2	80	80	598	1 40	834
1	1	1	1			8	7	105	80	27	20	152	100	80	80	57,825	1 35	76,950
1	1	1	1	48	96			3	2	1	1	4	3	81	75	560	1 25	700
1	1	1	1			5	5	90	89	25	24	115	113	80	75	30,332	1 25	37,915
1	1	1	1			2	2	42	22	10	8	52	30	80	80	8,784	1 27	11,155
1	1	1	1	12	25			4					4		85	824	1 15	442
1	1	1	1					1				1		80		80	1 25	100
1	1	1	1	180	400	1	1	13	16	5	5	18	21	70	70	4,716	1 15	5,424
1	1	1	1	162	324			12	4	2	1	14	5	85	85	3,372	1 25	4,215
1	1	1	1	15	33			3	3			3	3	80	80	615	1 43	878
1	1	1	1	10	25	1	1	2	2	1		3	2	80	80	530	1 25	662
1	1	1	1	45	100	1	1	7	3			7	3	50-70	50-70	1,100	1 20	1,320
1	1	1	1	48	96			5	2			5	2	90	85	960	1 25	1,200
1	1	1	1	25	50			4		1		5		90		960	1 26	1,182
1	1	1	1	50	100			5				5		70		760	1 25	950
1	1	1	1	12	27	1	1	2	1			2	1	70	70	1,200	1 25	1,500
1	1	1	1	80	180			6	3	2	2	8	5	55-75	55-75	841	1 20	1,016
1	1	1	1	25	60			4		1		5		87½		767	1 20	920
1	1	1	1	58	145			6	2	1	1	7	3	85	85	2,008		2,761
1	1	1	1	60	160			4				4		85		800	1 25	1,000
1	1	1	1	60	120			5	2	1	1	6	3	82½	70	748	1 37½	1,038
3	21	6	3	23	3,970	7,972	40	35	606	423	149	113	755	586		209,656	1 11	234,608

STATISTICS OF

RAY

Name of company.	Operator.	No. of days worked.	Kind of opening			Depth of shaft—feet.	Thick-ness of coal.		Power em-ployed.	
			Shaft	Slope	Strip-pit		Feet	Inches	Steam	Electricity
Bissell Coal Company.....	John Bissell	160	1	..	..	64	2	..	1	..
Bovard Brown C. Co. mine No. 3	Lockwood & Lusk	100	1	..	..	50	2	..	1	..
Darnel Coal Co.....	Darnel Coal Co	130	1	..	..	100	2	..	1	..
Diamond Coal Co	Pence & Anderson	200	1	..	..	80	2	..	1	..
Evans, L. D.	Joseph Loeven	100	1	..	..	83	1	2	1	..
Hartwell, Arnold & Co	J. W. Turner	109	1	1	..	..	1	8	1	..
Hayson & Douglas	Hayson & Douglas	120	1	..	..	80	2	..	1	..
Huston, Joseph	Joseph Huson	65	..	1	..	..	2	6	1	..
Kansas & Texas Coal Co	Kansas & Texas Coal Co	127	1	..	..	70	2	4	1	..
Mosby & Daugherty	Roney Brothers	150	1	..	..	60	1	10	1	..
Murray, Jesse	Douglas & Izett	60	1	..	..	70	2	..	1	..
Old Black Diamond	"	150	1	..	..	70	2	..	1	..
Pickering Coal Co.....	Joseph Pickering	190	1	..	..	107	1	10	1	..
Randall mine	Walsh & Henry	175	1	..	..	87	2	..	1	..
Rankin mine	A. F. Rankin	109	..	1	..	..	1	8	1	..
Richm'd & Camden C. Co. No. 1	Richm'd & Camden C. Co	113	1	..	..	60	1	10	1	..
" " " " No. 2	" " " "	113	1	..	..	60	1	10	1	..
" " " " No. 3	" " " "	130	1	..	..	55	2	..	1	..
" " " " No. 5	" " " "	130	1	..	..	70	2	..	1	..
" " " " No. 9	" " " "	130	1	..	..	100	2	..	1	..
" " " " No. 12	" " " "	130	1	..	..	110	2	..	1	..
Sater mine	H. W. Sater	90	1	..	..	156	1	10	1	..
Star, Alexander	Wm. Phillips	240	..	1	..	..	2	..	1	..
Williams Coal Co	Williams Coal Co	205	1	..	..	95	1	6	1	..
Wilson, Mrs. Wm. (formerly Hubbell Mining Co)	James Blair	125	1	100	2	4	1	..
		21	1	3	10	12

BALLS

Standard Coal Co.....	Standard Coal Co.....	270	1	2	3	..	1	..
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SALINE

Briggs, Isaac	John Kiper	40	..	1	1	6	..	1	..
Marmaduke, V	H. Bowman	180	1	65	2	6	..	1	..
Totals	1	1	1	1	..

SCHUYLER

Mock, T. J. & Co.....	T. J. Mock & Co.	120	1	24	4	..	1
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SULLIVAN

Locust Valley Coal Co.....	Preston & Pendeville. ...	234	1	202	3	4	1
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STATISTICS OF

ST. CLAIR

Name of company.	Operator.	No. of days worked.	Kind of opening.			Dep h of shaft—feet.	Thick-ness of coal.		Power em-ployed.		
			Shaft	Slope	Strip-pit.		Feet	Inches	Steam	Hand	Electricity
Allison mine.....	R. W. Allison.....	200	1	1	1	3	6	1	1		
Batchelor mine.....	Batchelor Bros.....	90			1	2	2				
Bell mine.....	Wm. E. Bell.....	60			1	2	6				
Browning, W. G.....	Wm. Dowers.....	60	1			1	8		1		
Donthat & Vannice.....	Donthat & Vannice.....	195	1			55	3		1		
Grantley, H.....	Michael Gore.....	120	1			38	4		1		
Hoover mine.....	W. A. Seymour.....	105		1		2	6				
Johnson Land Co.....	Wm. Watkins.....	110		1		2	6				
Kloss, C.....	Walker Bros.....	90		1		2	6		1		
Louis Coal mine.....	N. D. Gibson.....	90	1			89	4		1		
Totals.....			3	3	2					4	4

VERNON

Allen, L.....	E. Green.....	60			1		4				
Arthur Coal Co.....	Arthur Coal Co.....	150			1		5				
Bedford Coal & Mining Co.....	Bedford Coal & M. Co.....	150	1			50	3	6	1		
Burke, Margaret.....	J. D. Flake.....	105			1		2				
Barton, W. C.....	J. C. Lucas.....	95			1		1	2			
Central Coal & Coke Co.....	Central Coal & Coke Co.....	140	1			135	4	6	1		
		98	1			160	4	6	1		
Cooper mine.....	Cooper & Son.....	60			1		2				
Crawford mine.....	Crawford, C. B.....	40			1		2				
Davenport mine.....	Angur & Perkins.....	90	1				2	4	1		
Ferry mine.....	B. F. Ferry.....	150			1		3				
Larkin mine.....	W. E. Larkin.....	60			1		1				
Little Black Diamond.....	W. G. Gonterman.....	60	1				2	2		1	
Medlin mine.....	J. F. Medlin.....	30			1		1	2			
Mosher, H. G.....	T. T. Ling.....	58	1				2	2		1	
Nelson mine.....	R. F. Nelson.....	90			1		1				
Prewitt mine.....	W. H. Prewitt.....	75			1		1	2			
Rich Hill Coal & Mining Co.....	Rich Hill Coal & M. Co.....	130	1				4		1		
		128	1			188	4	2	1		
Robinson, Mrs. H. A.....	W. D. James.....	210	1			27	3			1	
Swope mine.....	A. W. Scott.....	240		1			4	3		1	
Vernon Coal & Mining Co.....	Vernon Coal & M. Co.....	253		1			4				
			5	6	11				6	2	5

157

COUNTY.

COUNTY.

[illegible]

TABLE VII.

SHOWING OUTPUT, BY COUNTIES, IN THE ORDER OF THEIR TONNAGE, AND A COMPARISON WITH THE PREVIOUS YEAR'S PRODUCTION—ALSO NUMBER OF MINES EMPLOYING TEN OR MORE MEN, AND THE NUMBER EMPLOYING LESS THAN TEN MEN.

Counties.	Tons of coal mined during the year ending June 30, 1894...	Average price rec'd per ton..	Am't. received for the year's output.	No. mines employing		Comparison of output			
				10 or more men....	Less than 10 men..	1893.	1894	Increase..	Decrease..
Macon	511,566	\$1 07	\$544,772	17	9	788,563	511,566	.....	276,997
Lafayette	296,931	1 52	457,459	26	29	371,928	299,931	.....	71,997
Vernon	297,599	1 11	330,342	8	14	234,376	247,599	63,223	.....
Bates	291,271	1 04	305,193	14	29	627,514	291,271	.....	336,243
Randolph	209,646	1 11	234,608	8	21	219,762	209,656	.....	10,106
Ray	196,852	1 50	295,634	16	9	319,405	196,852	.....	122,553
Fatnam	119,832	1 31	157,677	3	7	145,641	119,832	.....	25,809
Henry	84,473	1 44	122,059	13	22	125,982	84,473	.....	41,459
Linn	71,807	1 54	95,221	2	4	48,302	61,807	13,505	.....
Barton	55,767	1 04	58,224	4	10	61,301	55,767	.....	5,534
Audrain	43,910	1 47	64,724	5	7	42,262	43,910	1,648	.....
Grundy	35,000	1 90	66,625	2	.....	35,770	35,000	.....	770
Callaway	23,223	1 58	36,696	1	11	23,961	23,223	.....	738
Caldwell	22,869	1 79	41,018	3	1	29,020	22,869	.....	6,151
Adair	20,744	1 45	30,250	2	1	20,957	20,744	.....	213
Clay	19,371	1 60	30,995	1	.....	7,139	19,371	12,232	.....
Boone	19,038	1 49	28,428	3	9	25,602	19,038	.....	6,564
Johnson	15,427	1 46	22,425	2	10	12,101	15,427	3,326	.....
Montgomery	12,175	1 35	16,500	1	.....	15,923	12,175	.....	3,745
Jackson	6,720	1 95	13,104	1	.....	4,819	6,720	1,901	.....
Sullivan	6,600	1 25	8,250	1	.....	1,000	6,600	5,600	.....
St. Clair	5,337	1 61	8,612	1	9	6,517	5,337	.....	1,180
Ralls	4,400	1 10	4,840	1	.....	2,160	4,400	2,240	.....
Schuyler	3,556	1 25	4,945	1	.....	962	3,556	2,594	.....
Nodaway	2,984	2 56	7,560	.....	5	2,548	2,984	436	.....
Cooper	2,639	2 00	5,278	.....	4	2,892	2,639	.....	233
Dade	2,327	1 50	3,492	.....	5	6,685	2,327	.....	4,358
Cole	2,000	1 50	3,000	.....	1	1,200	2,000	800	.....
Saline	1,875	2 22	4,162	.....	2	1,865	1,875	10	.....
Pettis	1,738	1 91	3,334	.....	1	181	1,738	1,557	.....
Carroll	920	1 42	1,600	.....	2	1,088	920	.....	168
Livingston	800	2 00	1,600	.....	1	1,000	800	.....	200
Cedar	730	1 50	1,095	.....	3	890	730	.....	160
Chariton	185	2 10	407	.....	2	1,136	185	.....	951
Totals	2,883,322	1 28	3,013,075	136	229	3,190,442	2,883,322	109,072	916,126

TABLE VIII.

This table shows the annual product of each county producing coal, for a period of six years, together with the aggregate amount received for the output of the respective counties, the total production for the State, and total receipts for same. A comparison of prices per ton received for 1889 and 1894 is also shown, with the difference between the two.

TABLE VIII—COMPARATIVE TABLE OF TONNAGE AND
YEARS, 1889

Counties.	Number tons of coal mined.					
	1889	1890	1891	1892	1893	1894
Adair	16,522	14,840	16,110	14,820	20,957	20,744
Audrain	22,298	22,813	19,569	29,792	42,262	43,910
Barton	122,684	65,097	63,626	108,784	61,301	55,767
Bates	729,633	671,373	726,273	659,924	637,514	291,271
Boone	9,944	21,302	23,577	21,058	25,602	19,038
Caldwell	26,074	17,074	22,661	38,333	29,020	22,869
Callaway	12,633	18,355	15,581	16,551	23,961	23,223
Carroll				1,380	1,088	920
Cedar			1,264	4,181	890	730
Chariton		120	1,170	2,312	1,136	185
Clay		5,036	8,289		7,139	19,371
Cole			2,000	1,548	1,200	2,000
Cooper	1,027	1,594	2,200	3,666	2,892	2,639
Dade	2,290	1,400	3,402	6,881	6,695	2,327
Grundy	18,000	23,593	28,983	28,670	35,770	35,000
Henry	210,376	127,281	144,139	137,258	125,962	84,473
Howard		4,000				
Jackson					4,819	6,720
Jasper			633			
Johnson	12,803	13,187	10,530	10,485	12,101	15,427
Lafayette	320,448	329,845	352,603	347,600	371,928	299,931
Linn	2,136	13,403	28,036	35,588	48,302	61,807
Livingston		1,100	200	1,000	1,000	800
Miller		87	130	127		
Macon	223,660	457,896	454,029	685,335	788,563	511,566
Morgan		240	488			
Montgomery	20,003	14,744	12,124	16,039	15,923	12,175
Monroe		108	36			

VALUE OF COAL MINED IN MISSOURI FOR THE PAST SIX TO 1894.

Amount received at the mines for the output.						Av. per ton.		Difference
1889	1890	1891	1892	1893	1894	1889	1894	
\$27,980	\$29,379	\$28,511 25	\$24,365 00	\$31,247 25	\$30,250	\$1 70	\$1 45	25
36,497	30,117	30,038 97	50,164 85	62,085 65	64,724	2 03	1 47	55
153,542	83,818	92,179 94	128,869 50	73,863 70	58,224	1 25	1 04	21
755,278	713,039	762,740 88	699,927 35	700,562 56	305,198	1 03	1 04	1
14,916	31,172	34,574 50	32,590 25	38,365 50	28,428	1 50	1 49	1
54,571	34,660	40,674 00	76,097 16	57,749 75	41,018	2 09	1 79	30
19,677	30,517	24,977 03	26,179 35	36,769 50	36,636	1 55	1 58	3
.....	.....	.....	3,810 00	2,544 00	1,600	.....	1 42	....
.....	.....	1,666 00	6,230 00	1,299 00	1,096	.....	1 50	....
.....	240	2,340 00	4,503 00	2,190 00	407	.....	2 10	....
.....	7,554	14,920 20	.....	10,398 77	30,995	.....	1 60	....
.....	.....	3,000 00	3,096 00	1,620 00	3,000	.....	1 50	....
1,640	3,511	4,400 00	7,152 80	5,721 50	5,278	1 60	2 00	40
3,907	1,960	5,718 50	10,520 00	10,042 50	3,492	1 70	1 50	20
35,000	48,366	53,300 00	68,983 00	73,328 50	66,625	1 95	1 90	8
217,694	193,221	211,834 01	199,735 00	185,643 77	122,059	1 03	1 44	41
.....	5,600	.....	.....	.....	.....	.....	.....	....
.....	.....	.....	.....	9,638 00	13,104	.....	1 95	....
.....	.....	349 50	.....	.....	.....	.....	.....	....
21,713	21,113	17,100 50	18,441 42	19,223 75	22,425	1 70	1 46	34
536,997	508,743	545,551 17	536,092 95	551,528 96	457,459	1 67	1 52	15
4,272	21,720	44,630 09	56,214 96	75,850 81	95,221	2 00	1 54	46
.....	2,250	450 00	2,259 00	1,750 00	1,600	.....	2 00	....
.....	218	325 00	317 50	.....	.....	.....	.....	....
309,443	585,925	576,678 51	717,173 02	824,478 26	546,772	1 38	1 07	31
.....	480	1,064 00	.....	.....	.....	.....	.....	....
14,769	21,595	17,753 40	21,706 65	21,496 05	16,500	1 47	1 35	12
.....	163	24 00	.....	.....	.....	.....	.....	....

TONNAGE AND

Counties.	Number tons of coal mined.					
	1889	1890	1891	1892	1893	1894
Nodaway.....	.....	.....	2,222	1,850	2,548	2,984
Pettis.....	.....	.....	.....	433	181	1,738
Putnam.....	75,877	91,584	123,526	134,984	145,641	119,833
Ralls.....	.....	675	614	280	2,160	4,400
Randolph ..	184,609	245,898	224,758	296,011	219,762	209,568
Ray.....	207,829	240,462	282,247	272,948	319,405	196,853
Saline.....	832	660	7,981	4,440	1,865	1,875
Schuyler.....	.....	800	280	766	962	3,556
Shelby.....	.....	40	8	.....	.....	.....
Sullivan.....	.....	.....	560	8,800	1 000	6,600
St. Clair.....	.....	.....	3,866	5,405	6,517	5,337
Vernon.....	13,313	33,292	64,303	119,036	234,376	297,599
Totals.....	2,222,981	2,437,399	2,650,018	3,017,285	3,190,442	2,383,323

VALUE—Continued.

Amount received at the mines for the output.						Av. per ton.		Difference
1889	1890	1891	1892	1893	1894	1889	1894	
.....	.....	\$5,504 50	\$4,720 00	\$6,487 25	\$7,560	.....	\$2 56	....
.....	.....	.....	932 50	324 50	3,334	.....	1 91	....
\$107,581	\$116,883	143,554 00	172,483 20	198,357 43	157,677	\$1 41	1 31	10
.....	1,020	1,151 00	490 00	3,132 00	4,840	.....	1 10	....
272,244	318,833	266,422 77	379,232 08	245,720 61	234,608	1 47	1 11	36
324,740	387,346	446,860 41	421,631 61	486,231 08	296,634	1 56	1 50	6
1,872	1,265	14,664 00	8,873 25	4,018 50	4,162	2 25	2 22	3
.....	375	450 00	957 50	1,202 50	4,945	.....	1 25	....
.....	80	16 00	.....	.....	.....	.....	.....	....
.....	.....	1,120 00	13,600 00	1,750 00	8,250	.....	1 25	....
.....	.....	5,999 50	9,362 50	10,171 50	8,612	.....	1 61	....
14,841	38,188	79,540 20	129,126 17	244,883 02	330,342	1 11	1 11	....
2,929,174	3,234,351	3,480,866 83	3,825,828 57	3,999,681 17	3,013,075	1,318	1,264	064

ACCIDENTS IN COAL MINES.

In the report of last year we made a prediction concerning accidents for this year as follows:

"We are fearful, however, that the current year will not reduce the number of accidents, as there has been introduced in our State within the last few months, many miners foreign to and so unfamiliar with our methods of mining, and the character and nature of our coal, that many accidents are anticipated as the result." This prediction has been fulfilled, as 33% of the entire number of fatal accidents that occurred, happened to late importations of Alabama negroes brought to this State to take the place of striking miners. Many others met non-fatal accidents. When a strike occurs, the operator, in his effort to keep the mine in operation, or for the purpose of defeating the strikers, or for both reasons combined, too often permits the employment of a class of men that "booger" up a mine, cause accidents and bring about much trouble and uneasiness, simply because, as a rule, they are not reliable or practical miners, but on the other hand, a reckless, indifferent and totally unworthy set, as may be evidenced in their disposition to defeat fellow-laborers, no matter how just the miner's claim and act may be. There are more than enough miners to do all the work in mines that may be offered within the limits of the State, and no difficulty would be experienced in securing a full complement of practical and worthy miners at any time. The situation could be greatly improved for the operator and miner, if some legislation or understanding between operator and miner could be arrived at, by which a man, before entering a mine as a miner, should be made to establish the fact that he had served an apprenticeship at mining, and that an apprentice or helper be permitted to engage in work under the supervision of a practical miner, and do only such work as may be suitable for the inexperienced. There is a looseness connected with this feature of coal mining not permitted in other lines of business. In almost all other kinds of trade, men are employed because of their fitness and qualification to perform understandingly the work given them to do; and if miners were paid by the day instead of by the bushel or ton, how long would it be until the present character, capacity and class of men employed in the mines would be revolutionized? Then, if upon *a purely business proposition*, it is expedient to employ only the practi-

cal and worthy miner, why is it that the life, health, safety and comfort of the man who has spent a life-time in the mines, has not a proper and first claim to having placed about him the necessary safeguards that his situation demands? As it is, the practical, steady and cautious miner may be ever so careful, using his best judgment, arrived at by years of experience, in keeping his room in a workable and safe condition, is allowed to be blown into eternity without the slightest warning, by the ignorance and carelessness of some tramp, who has been given an adjoining room to work. There is, also, much to be feared from that class of miners becoming more and more numerous in our State, who represent the lowest, most degraded and vilest classes of all Europe, who have flocked to the mines in the eastern states, with the understanding that prices paid for mining were so good, backed by the flattering reason—why in the interest of the miner—the prices would be maintained, only to find that in the face of all this, prices have steadily declined, and at last reached such figures that even they could not stand the reduction, and they are now seeking the coal-fields of the west. Gradually, the old and the native miner who does possess good morals, a love of country and wholesome regard for law and order, is giving place to this new importation, altogether void of the virtues mentioned in the others. It does seem that indifference to the great evil in store for us will prevail, until every mining camp harboring them will be cursed and blighted by a moral leprosy that cannot be cured.

AUDRAIN COUNTY.

John J. Burge, a young man 17 years of age, who was a miner, while working with his brothers, was killed Dec. 1, 1893, in the mine of the Vandalia Coal Co.

The coroner's verdict was, "that the deceased came to his death by his own negligence." The accident was caused by a fall of slate in the roadway of his room. It appears that the deceased, at the time of the accident, was taking up bottom for road in his room, and that while so engaged, pulled out a prop that was holding up the loose slate.

BARTON COUNTY.

Albert C. Cole, a miner employed at the Wear Cole Co. mine, was killed by a fall of rock April 11, 1894.

The deceased had worked in the room continuously from the start to the point reached at the time of the accident, which was 100 feet in. The room was well timbered; the pieces of rock that fell came from between two slips right at the face of his working place. It was

an accident, pure and simple, and was something entirely unforeseen by either the deceased or the company. Coroner decided an inquest unnecessary.

BATES COUNTY.

C. N. Butts, a miner, but also a partner in the operation of the F. A. Raney & Co.'s mine, was killed January 2, 1894, by a fall of roof. Mr. Butts was 34 years of age, and a married man. At the time of the accident deceased was in the act of setting a prop, when a piece of the soapstone-roof fell upon him.

The coroner after visiting the mine and learning the facts, deemed the holding of an inquest unnecessary.

Cyrus Summers, a miner working for J. W. Flansburg & Son, met with a fatal accident January 6, 1894. The deceased was evidently not a practical miner, for from what we can learn he was working a room on an entry driven off from a strip-pit, from which it will be seen that he was working a place necessarily treacherous. In addition to this, he was working his room without using sufficient number of props, although props were found on the entry at the mouth of the room. The operators notified this office, but against their better judgment were prevailed upon not to send for a coroner, as they were informed it was necessary to secure the wishes of the friends of the deceased.

The law expressly states it as the duty of an operator in case of a fatal accident, to wire the Mine Inspector, and notify the coroner, and if latter be prevented from any cause, any justice of the peace of the county shall be called on to take the place of the coroner.

JACKSON COUNTY.

Frank Duggins, Jerry Fuller, Eugene Parker and W. Sattler were killed by an explosion March 2, 1894, at the mine of the Kansas City Clay & Coal Co.; and at same time and place, from same cause, Steve Terry and O. L. D. Wilson were injured. For details see testimony before coroner's jury, and the article by the Inspector of Mines on the explosion and following the account of accidents by counties.

State of Missouri, } ss.
County of Jackson. }

INQUEST.

Be it remembered, that an inquest held in the coroner's office in the county court-house, Kansas City, Jackson county, Missouri, commencing on the 3d day of March, 1894, at the hour of 10 a. m., and ending March 6, 1894, at the hour of 4 p. m., over the bodies of Thomas Duggins and Eugene Parker, whose death was due to an explosion in Brush creek coal mine, March 2, 1894, about 3 p. m. Inquest conducted by Doctor John M. Longsdale, Corner, Jackson county, Missouri

[Assisted by Mr. Charles Evans, State Mine Inspector of the State of Missouri, who came purposely from Jefferson City to assist in the examination]. The following proceedings were had, to wit:

After the jury had been sworn and viewed the bodies, the coroner introduced the following evidence:

James Blair was the first witness called, who, after having first been duly sworn, testified as follows:

Q. What is your full name?

A. James Blair is my full name.

Q. Where do you reside, Mr. Blair?

A. In Kansas City.

Q. What street and number?

A. 2902 Highland avenue.

Q. What is your business, Mr. Blair?

A. Mining business is my business.

Q. Been following the mining business a good while?

A. Yes, sir, I have been following it quite a good while.

Q. Have you held the capacity as mine boss?

A. Yes, sir, I have.

Q. Who do you operate for at the present time, if anybody?

A. For the Kansas City Clay and Coal company, at the present time.

Q. Were you operating for them last Friday, the day this accident occurred that resulted in the death of two men out at your mine?

A. Yes, sir, I was out there at the time.

Q. It is your business to stay out there?

A. Yes, sir.

Q. Present at the time Duggins and Parker were killed?

A. Yes, sir; I was not right there where they were at the time they were killed; I was present at the mine.

Q. Mr. Blair, you may just go on and tell the jury in your way, all that you know in regard to this accident, speaking slowly and distinctly, so that the jury and stenographer can hear you.

A. Well, the first thing that I knew about the accident occurring, the first that warned me of anything happening—I didn't know then that anything had happened—the first thing I heard was the report. I didn't think it had hurt anyone. I was on top at the time. As soon as I heard it I ran to the shaft, and just as soon as I got there I hallooed down and asked where that gas went off, and they hallooed back that it went off in the northwest. I then went right down to the engine room, just as quick as I could, and got the safety lamp, and went down with the lamp directly; when I got the lamp I started down; when I got to the bottom I found some men at the bottom; I don't know just who all they were. I then asked some of them where the explosion occurred, and I think that some of them said that it occurred in the south entry.

I went to the south side and went as far as I possibly could. I met a door and there I met some men coming up to this entry; I went on as far as I could until the after-damp got so bad that it was impossible for me to go any further; it got terribly bad in there. Before this, on my way in I had met a man groaning; he was lying there groaning; me and some other party that was there helped to pick him up and took him out to a place of safety, and then we afterward took him up out of the mine.

I then went on further in there. I had during all this time the safety-lamp with me; that is the only kind of a lamp that I could take and use with me down there at that time. All the while I was pushing on, the after-damp kept getting worse and worse: it got so after while that I thought that I would not be able to go any further, but by putting my hand over my nose and mouth, I was able to push on a little further; I had to come back again, but I didn't get much further; the after-damp became too bad, and I seen that it was beginning to overcome.

After I seen that I would not be able to go on any further, I crawled back the best that I could, and then I went to see if any stopping had been blowed out; I found the stopping blowed out, so we could drive the air in the empty current—the stopping. It was then that we thought that we could go further in, and we started to try it again the best we could; this time we had better success than we did at first, and this time we got in to the place where we found Parker; we found him lying there dead on his back in the roadway. I told the men to get things ready so that we could take him out as quick as possible; by this time there was three or four men behind me, who had followed me in the last time that I made the effort.

I told them to get him out just as quick as they could; I don't know who the men were that were following behind me; I didn't have time to see who they were then; I told them to go back and get a car just as quick as they could, so that we could take the body of Mr. Parker out of there; they instantly turned back to get the car to take Mr. Parker's body out, and while they started back to the car, I went to pushing on again, further into the mine; I went just a little bit farther on from where we found the dead body of Mr. Parker lying, and I found another body lying there. By that time I didn't know how many were in there; I began to suspect that there were more further back, but by that time they had got back with the car that I had sent them after, and I began asking about who else might be in there, and a man, that was there by the name of McAlister, said that these two men were the only men that were missing, and I then asked him if he was sure about that, and he said he was sure that they were the only ones. We then loaded the two men on the car, and they took them up out of the mine. I didn't go any further just at that time, as I didn't think there was any use of it. That is about all I know of the accident.

Q. Who was the second body that you found in there?

A. The first man that I found was Mr. Parker, and the second man that I found was Mr. Thomas Duggins. I would have went on further in to see if any one else was there, but Mr. McAlister he says that they were the only two men that was missing, and I then ask him if he was sure that they were the only two, and he said that he was, and I said, well, if I was not sure those were the only two men that was missing, I would go further in after I found the second body; I began to suspicion that quite a number of them had been killed—everything was so excited when I first started down, that it was impossible to tell who was up and who was down; Mr. McAlister he came in afterward.

We took the men to the cage on the car and then put them on the cage and took them up out of the mine. Before I came up I left men down there to see that everybody that was in the mine got out all right, and to see that no one else was down there, but they were sure that everyone that was in there was out. I was pretty sure myself, then that there was no one else left down there, and I then came out myself.

Q. You are the superintendent or foreman of that mine?

A. Yes sir, I am.

- Q. You employ the men, do you, who labor there in the mine?
- A. Yes sir, that is my duty.
- Q. Have you ever had any trouble there before, with gas or this damp that you speak of?
- A. Well, not to any great extent; we have had small explosions of gas once in a while, at different times we have always got along very well there, considering all things.
- Q. What has been the cause of the explosions that you had here before this explosion?
- A. I don't know what could have caused it unless the gas would have generated into the roadways.
- Q. Caused by the accumulation of gas in the roadways and pockets of the mine?
- A. Yes sir.
- Q. The pockets are in the roadways?
- A. Yes sir.
- Q. And in these the gas accumulated?
- A. Yes sir.
- Q. What are your facilities for exhausting the gas that accumulated during the time the men were working in the mine; what are your facilities for getting fresh air to the men in the mine?
- A. We have a fan that supplies the air to the men while working.
- Q. What is the size of this fan?
- A. It is a 10-foot fan.
- Q. You have had that fan there all of the time?
- A. Yes, sir.
- Q. Have you only the one fan for the mine?
- A. Yes, sir.
- Q. Did any one ever tell you that the fan that you had there, the 10-foot fan that you were using, was not large enough to exhaust the gas and supply fresh air for the men in the mine?
- A. No, sir; I don't think that any one ever told me that.
- Q. You are sure of that?
- A. Yes, sir; I don't remember of any one ever telling me that.
- Q. You are an experienced miner, are you?
- A. Yes, sir; I know a good deal about mining.
- Q. How long have you worked in a mine?
- A. Well, sir; pretty near ever since I was able to work in one.
- Q. How long has that been?
- A. I have worked in mines ever since I was 12½ years old.
- Q. You have followed mining ever since you were 12½ years old?
- A. Yen, sir.
- Q. Worked in different kind of mines?
- A. Yes, sir.
- Q. How much space have you in that mine—how much space have you altogether in that mine?
- A. I don't know just exactly to a foot how much space we have; it is in a circle; I should think it is about six or four hundred feet.
- Q. Six or four hundred feet?
- A. Yes, sir.

Q. Is that in one room or in different rooms or pockets, as you call them?

A. It is pretty much in one circle; it is a large circle, you might [say].

Q. Where is the fan situated?

A. It is situated on the east side of the shaft.

Q. How far from it?

A. I guess that it must be about four or five feet from the shaft; it is kind of to the side.

Q. This fan situated in that place, is it supposed to exhaust in each room or pocket in that mine—exhaust all of the gas in the whole circle?

A. Yes, sir.

Q. When you are at work in the mine can you feel the current of air passing through the mine?

A. Yes, sir; you can easily feel it.

Q. What is the velocity of the current of air—what was the velocity of it when it was last tested; what is the velocity of the current per minute—how many feet per minute?

A. I don't know just exactly; never made a test of it; you can't tell exactly; you could only tell some time by guess.

Q. It goes altogether in one volume?

A. Yes, sir.

Q. How do you test the volume?

A. We can feel it and see that it is making a good direction.

Q. You test it just by the sense of touch and feeling?

A. Yes, sir.

Q. Are there not instruments for the purpose of testing the volume?

A. Yes, sir; I think there is such an instrument.

Q. You have no such instrument there in your mine?

A. No, sir.

Q. Just go on the sense and touch?

A. Yes, sir.

Q. Do you think that is safe?

A. I think so; yes, sir.

Q. Did you ever work in a mine where they had an instrument for testing this matter?

A. Yes, sir.

Q. Did you ever see them used?

A. Yes, sir; I never worked at any place where they kept one just for that purpose; I don't think they keep it regular for that all the time.

Q. Who are you employed by?

A. By Mr. Ed. Phillips.

Q. He is receiver for that mine?

A. Yes, sir.

Q. Was Mr. Phillips out there at the time the accident occurred?

A. No, sir.

Q. Never had an explosion out there of that sort before?

A. No, sir, nothing like that.

Q. Do you know the law regarding mine inspection, and so on?

A. Yes, sir, I supposed that I did; I found out afterward that I didn't know it as well as I thought I did; I found out that I didn't notify the State Mine-inspector as soon as the accident occurred, which I should have done. I thought at the time that it was my duty to notify the coroner, and I thought then that the

coroner in his turn notified the State Mine Inspector; but I find out I was wrong in regard to that.

Q. That is in order that the State Mine Inspector can inspect the explosion immediately?

A. No, sir.

Q. Were you there when the State Mine Inspector last inspected the mine?

A. Yes, sir, I was.

Q. When was that?

A. That was some time in December; I don't exactly remember the exact date of this visit.

Q. Did anyone ever tell anything that the State Mine Inspector said in regard to this mine?

A. I don't think so; I don't remember being told that the State Mine Inspector had said anything to anyone else in regard to the mine. I know that he recommended that a more efficient and safe method be used for the exhausting of gas and supplying fresh air to the mine; that is, I believe he said something about that.

Q. Well, was that all?

A. He talked about having an escapement-shaft put in.

Q. An opening to allow the gas to escape?

A. Yes, sir.

Q. That was for what the escapement was for?

A. No, sir, they didn't tell me that; they told me that it was for the escapement of men, in case of fire or accident of some kind that might happen in the mine.

Q. What would hinder them from going out of the main shaft?

A. That should become affected should the main shaft in some manner be shut off, and then the men could make their way out through the escapement.

By the jury: Would that new opening be what you should call an air-shaft and an escapement, both?

A. Yes, sir, it could be made both.

Q. It would have to be arranged differently to suit both?

A. Yes, sir.

Q. Do you know whether parties that were employed in this mine were in the habit of setting the gas on fire just for fun, to see it burn?

A. I have heard that such was the case, and in one or two instances I have found out that it really happened, and I have checked them immediately and told them not to do so, that it was very dangerous and that I would not stand it.

Q. But it happened quite frequently, did it not?

A. No, sir, I don't think so after I put a check on it; whenever I found out that anything of that sort was going on, I always put forth my best effort to stop it, and threatened to fire the men who were implicated.

Q. Were those men old or new miners?

A. They were old miners.

Q. When it happened, were there any serious results from it?

A. No sir, I spoke to the miners about it, and they seemed to think there was not much danger in it, but I told them that I would not have it.

Q. Have any of the miners set the gas on fire, lately?

A. Not that I know of.

Q. Now, in your own opinion, what caused this explosion last Friday?

A. Well, as near as I can come to it, it was gas that caused the explosion.

Q. What was it that set the gas on fire? In what manner did the explosion occur?—what caused the explosion?

A. Well, from my investigation, and all that I have been able to find out since the explosion occurred, it was set off by a lamp on the head of one of the pushers; everything seems to indicate—everything that I can find out.

Q. It was naked lamp?

A. Yes sir.

Q. Not a safety lamp?

A. No sir.

Q. Those lamps are used generally, in mines, those safety-lamps?

A. No sir.

Q. You don't use safety-lamps on heads of miners, on their hats?

A. No sir, they could not be used on their hats.

Q. Use nothing but the naked lamps on their hats?

A. Yes sir, that is all.

Q. Speaking of the after-damp, what is the after-damp?

A. It is the carbonic acid generated by the fire. The fire takes all the carbonic acid out of the gas, and that leaves what is commonly—

Q. It takes all of the oxygen out of the gas?

A. Yes, sir.

Q. You don't have the after-damp then until after the explosion?

A. No, sir.

Q. Give me the names of the miners who were in the direct vicinity of the explosion.

A. Well, I don't know if I can remember all of the names, but I will give you what I can think of: there was Stephen Terry, O. L. Wilson, E. Parker, B. E. Mar-dist, John Calvin, J. Lyons, J. H. Wade and D. Miller; that is all that I can remember of just now.

Q. Do you know which one of the miners caused the explosion?

A. It is one of the pushers that I heard caused the explosion.

Q. Well, what was his name?

A. Thomas Duggins.

Q. He was one of the men that was killed?

A. Yes, sir.

Q. What evidence have you that he was the one that caused the explosion—that ignited the gas?

A. The evidence of the party that saw him at the time that he ignited the gas.

Q. Who was that party?

A. O. L. Wilson.

Q. Who else saw him at the time that the explosion occurred?

A. I think he was the only one.

Q. Where was he at the time that the explosion occurred?

A. He was sitting on the roadway, and saw the whole thing.

Q. He claims to have seen it at the time that ignition took place?

A. Yes, sir.

Q. Is Mr. Wilson here today?

A. No, sir; he was one of the men that was injured; he was not able to come.

Q. He made that statement to you.

A. Yes, sir.

Q. How long has it been since you had a strike there ?

A. We had one out there ; I think it was the latter part of January.

Q. What was the cause of this strike ?

A. The cutting of the prices.

Q. What was the former price ?

A. It was six cents per bushel.

Q. What was the price cut to ?

A. The company cut the price to five cents per bushel.

Q. How long did the strike last ?

A. Little over a week.

Q. Did all the miners quit ?

A. Yes, sir.

Q. All stop working ?

A. Yes, sir ; all of the men did not want to strike ; part of them wanted to keep on working, and part wanted to strike, and the result was they all quit working ; those that quit were quite contrary, and they caused the rest of the men to quit ; some of the men told me that they did not want to quit work—that they could not afford to quit, but were compelled by the other miners to quit.

Q. Do you know whether Tom Duggins was one of the strikers—one of the leaders in the strike ?

A. No, sir ; I don't think he was ; I heard afterward that he had a mother to support, and that he could not afford to quit on that account.

Q. He was one of the men that did not want to quit work ?

A. I think so, I couldn't state positively ; I don't think that he took any active part in the strike.

Q. Did you ever hear of any of the miners threatening to purposely cause an explosion on the mine ?

A. No, sir.

Q. Duggins was a peaceable sort of a man ?

A. Yes, sir.

Q. Where did this gas accumulate in sufficient quantities to cause the explosion ?

A. I couldn't tell ; it seemed to be in the roof ; the squeezing of the roof was settling, and the only way that I can account for it is, that while the roof was settling, it must have opened up a feeder of gas.

Q. A feeder was liable to break out any time ?

A. Yes, sir.

Q. How long would it be after one of these openings occur before it was discovered ; without being discovered ?

A. The gas would come in very quick, in fact pretty near as soon as you could open the feeder.

Q. It could be immediately detected ?

A. Yes, sir, tolerably quick.

Q. Can you stop one of these feeders ?

A. Yes, sir, by stopping the roadway.

Q. You can stop up the roadway by nailing up boards ?

A. Yes, sir, that is one way that you could stop it.

Q. How could you drive this gas out ?

A. With air ; you could drive it out by driving the air in a certain direction.

Q. You can drive the after-damp out with air ?

A. Yes, sir.

- Q. That is the course you pursue to drive the after-damp out ?
A. Yes, sir.
- Q. You pursued that course after the explosion occurred ?
A. Yes, sir.
- Q. This air is driven through the mine by a fan ?
A. Yes, sir.
- Q. What is the size of a fan usually used in a mine in the capacity of your mine ?
A. Well, they are different sizes ; they run all the way from 10 to 14-foot fans.
- Q. That is for mines the size of that mine ?
A. Yes, sir.
- Q. What is the size of the fan you have been using at this mine ? is it a 14-foot fan ?
A. No, sir.
- Q. What is it, then ?
A. It is a 10-foot fan.
- Q. That is the smallest size used in mines of the capacity of the one you are operating ?
A. Yes, sir.
- Q. That is the fan that was first used when the mine was first opened ?
A. Yes, sir.
- Q. Wasn't it about time you were getting a larger fan ?
A. I think they are going to get a larger fan later on.
- Q. As a matter of fact, was not that fan too small for the capacity of your mine, didn't furnish enough air ?
A. I think that when the fan was kept properly running that it furnished enough air for the whole of the mine. I think that the men at certain times had more air than they desired. I know I have had complaints from men that worked in different parts of the mine that sometimes the air would be too strong for them.
- Q. The larger the mine, the size of the fan should also be increased ?
A. Yes, sir ; where the mine gets beyond the capacity of the fan, I think, when everything is running in good condition, that the fan furnished plenty of air.
- Q. Haven't you had complaints from the miners at different times that the facilities for the exhaustion of the gas in the mine was very poor and very dangerous ?
A. No, sir.
- Q. None of the workmen ever protested against it ?
A. No, sir ; none that I ever knew of ever objected on that account ; they never made any such objection to me personally.
- Q. What is the depth of your mine ?
A. The depth is 230 feet from the surface.
- Q. What room have you—what is the working space ?
A. We have working space for about two and a half feet.
- Q. Most of the men were working in the mine at the time the explosion occurred ?
A. Yes, sir.
- Q. Were you down in the mine at the time it occurred ?
A. No, sir ; I was on top at the time it occurred.
- Q. Do you mine anything besides coal ?
A. Yes, sir ; we mine some fire-clay.

Q. How was it that there was so much in the mine at the time the explosion occurred?

A. I don't know.

EXAMINATION BY STATE MINE INSPECTOR EVANS.

Q. Where were you, Mr. Blair, when the accident occurred?

A. I was outside of the mine; I was not in the mine at the time the explosion occurred.

Q. What time of day was it?

A. I don't know, exactly; I was excited at the time; I think it was about 2 o'clock; I don't know for sure; I am just guessing at it.

Q. Had you been down that day in the mine?

A. No, sir, I hadn't been down in the mine.

Q. You don't know anything about the condition of the mine that day?

A. No, sir, I don't know anything personally; what I know is what I was told about it.

Q. Don't know anything of your own personal knowledge?

A. No, sir.

Q. Were you down in the mine the day before?

A. Yes, sir.

Q. What part of the mine did this accident happen in?

A. It happened in one of the entries.

Q. It happened in the south entry?

A. Yes, sir.

Q. What part of the entry?

A. Well, as near as we could find out, it was near the head of the entry.

Q. I understood you to say that the gas was ignited from the lamp of one of the pushers; was that right?

A. Yes, sir; as far as I could find out.

Q. What was he doing?

A. He was working in the roadway, getting some cars out.

Q. Was he pushing the cars at the time the explosion took place?

A. Well, I can't say that for certain.

Q. How many men were around there at the time the accident happened?

A. Well, as near as I can find out, there was four men right at the roadway; two was working straight ahead, and two was under the brushing, and two in the roadway with Parker.

Q. Did any of these men get hurt?

A. Yes, sir; several of them got badly hurt.

Q. Had the wheelers been running backward and forward all day?

A. Yes, sir.

Q. How long had they been in the entry before the explosion.

A. I don't know exactly, but the man that was attending the men told me that as near as he could guess, they had been in there about three-quarters of an hour.

Q. Were you ever bothered with gas in that entree before?

A. Yes, sir, a little bit in there sometimes, and sometimes in large quantities; when the gas would get in there in any great quantities we would have to use the fan until we got it all brushed out; there were other places in the mine where the gas was just as bad as in that entry.

Q. How far from the face of the coal to the entry, where you had been brushing.

A. I don't know exactly.

Q. Well, can't you give us an estimation?

A. I don't think that it is over 15 or 16 feet; it is probably a little less than that.

Q. About 15 or 16 feet?

A. Yes, sir.

Q. It would be quite possible, would it not, for any feeder to break back 16 feet from the face?

A. Well, sir, I have seen it so; I have seen it happen while the work was progressing, not after it was done.

Q. What speed do you generally run your fan?

A. Well, I don't exactly know what speed it is; I don't know just how many revolutions the fan makes per minute; I have not tried it lately, but I know that it has been keeping up a good heavy speed all the time; my directions are that the fan shall be kept going at a good rate of speed; I do that in order that the gas may be thoroughly exhausted from the mine.

Q. How has the fan been acting lately?

A. Here lately one or two times we have had to patch it up a little; it has been getting out of order some here lately; we had to take a little piece off to keep it clear once or twice.

Q. During the last month have you had much trouble with the fan breaking down and getting out of order frequently?

A. Yes, sir, a few times we have had trouble with the fan; the fan never has run well; have had trouble with it for quite a while, off and on, but the trouble was soon repaired whenever happened; I always see to that.

Q. Well, about how often does it get out of fix?

A. Well, not very often.

Q. And you had it repaired immediately?

A. Yes, sir.

Q. Had it been out of fix that day, the day that the accident occurred?

A. Yes, sir.

Q. What time during the day?

A. It was in the morning.

Q. What hour during the morning?

A. It got out of order about 9 o'clock; it was out of fix a little at that time.

Q. Were the men called out during the stoppage?

A. No, sir.

Q. Did any of the men notice it or make any remark about it?

A. No, sir, I don't think they did; if they said anything about it, it was not to me that they spoke.

Q. Did the fan stop any more that day, up to the time that the accident occurred?

A. No, sir.

Q. The fan didn't stop a little before the accident occurred?

A. No, sir, I don't think so.

Q. What does get out of fix, the shaft or the fan?

A. It has been the fan that has been getting out of fix.

Q. Is the shaft in good condition?

- Q. The box covering the fan in good condition ?
A. Yes, sir.
Q. Did you notice whether or not the box was tight or not after the accident occurred ?
A. I think that it was ; yes, sir.
Q. Who did you send around to try the gas that morning ?
A. One of the men.
Q. What is his name ?
A. James Grant.
Q. He is a miner ?
A. Yes, sir.
Q. Will he be a witness here today ?
A. Yes, sir, I think so.
Q. He examined the gas—he made the examination that morning ?
A. Yes, sir.
Q. What did he report when he came out of the mine that morning ; did he report the mine all right ?
A. I think he reported the mine in good condition.
Q. You run the fan all night ?
A. Yes, sir.
Q. Was it running the night before the accident occurred ?
A. Yes, sir.
Q. Kept running all night ?
A. Yes, sir.
Q. Now, in regard to the escape-shaft, the coroner, while he was examining you, asked you if that was there for the purpose of a better ventilation, and you replied that it was for the escapement of men in case of fire or other accidents of some kind that might happen in the mine ; now that could be used also for the escapement of air—could be used for an air-shaft if it was so fixed and kept in proper order ?
A. Yes, sir, I suppose so.
Q. Well, isn't that what it is for ?
A. Yes, sir.
Q. In fact, it is used just as much for an air-shaft as an escapement for men in case of danger ?
A. Yes, sir.
Q. Don't you believe that it is the best way to ventilate a mine and the only practical way by which a mine of that sort can be ventilated in the proper way ?
A. Yes, sir, I think you are right about that.
Q. And you don't know the exact condition of the mine ? All you knew about that day was what you have been told ; you hadn't been down there ; all your information was just hearsay ?
A. Yes, sir, that morning.
Q. What is the reason that you did not go down in the mine that day ?
A. I didn't have time to go down.
Q. Was there anyone down there that day with safety lamp ?
A. No, sir.
Q. No one at all ?
A. No, sir.

Q. Did you understand that there had been several requests that the escapement-shaft should be put down immediately?

A. Yes, sir, I did.

Q. Well, tell us what you know about that.

A. I don't know very much about it; I was told—you told me when you was there the last time; you suggested it to me that an escapement-shaft ought to be put down there; I believe that you requested that the shaft should be put in—I was told afterward by Mr. Phillips, he is the receiver for the company, that you had notified him to have the escapement-shaft put in.

Q. Mr. Phillips told you that on one of his visits to the mine?

A. I answer, yes, sir, I believe that it was while he was at the mine.

Q. Was there anything done immediately toward going to work at it?

A. I don't think so, no, sir.

Q. He told you I urged him to do so?

A. Yes, sir, I believe so.

Q. Have you had any collection of gas, very much gas, in any certain part of the mine?

A. Yes, sir; I have been told that there was some gas in different entries in the mine, and when such was reported to I would tell the men below to go and attend to it at once.

Q. Attend to it in what way?

A. See that it was gotten out, see that things was arranged in such a manner that it would go out.

Q. There was nothing to obstruct your air in places where it should be. Did you keep everything well open?

A. Yes, sir.

Q. Was this man Grant, that examined the mine during the morning, a competent man for that purpose?

A. Yes, sir, I thought that he was a competent man.

By the Coroner:

Q. Is this an open fan that you used there?

A. No, sir, a closed fan; you couldn't use any other sort of a fan there; the air would be all exhausted before it got to the place that it should be.

Q. This fan is boxed in?

A. Yes, sir.

Q. At the time that the accident occurred, were the doors leading to this fan all closed?

A. I think they were all.

Q. And the fan was running along in good condition?

A. Yes, sir.

Q. The men obtaining plenty of fresh air at the time?

A. I don't know; I should think they would get plenty of fresh air when the fan is running along in good condition.

Q. That fan is run by an engine?

A. Yes, sir.

Q. Have you an engineer who is employed to run that fan?

A. Yes, sir.

Q. He has nothing else to do?

A. No, sir.

By the jury :

Q. You say there was a free circulation of air around the face of the mine all the time ?

A. Yes, sir.

Q. Was there any harm done the mine by the explosion ?

A. Some of the stopping was blown out ?

Q. What do you mean by the stopping being blown out.

A. That stopping was in there to make free circulation, when you put the stopping in it turns the air, and keeps it from making a shorter cut back to the air-course.

Q. You put the stopping in where there was no need of air, to turn the air off in another direction where it was more needed ?

A. Yes, sir.

Q. Do you know whether these men that were killed, were getting good air at the time the explosion occurred ?

A. I don't suppose they were, or the explosion would not have been so heavy.

Q. When did Mr. Phillips tell you that he expected to make this improvement in regard to the mine ?

A. He spoke about it the latter part of December, right after the inspector had been there, soon after he left.

Q. He told you that the inspector had so ordered ?

A. Yes, sir.

Q. When you want to shut off the air in one place you close the rooms up ?

A. Yes, sir.

Q. And no air gets into them ?

A. No, sir, I suppose some air gets in there.

Q. You are workin' that mine in a circle, are you not ?

A. Yes, sir.

Q. You also mine fire-clay ?

A. Yes, and coal.

Q. Is the circle so made so that the air given out by this fan can penetrate any part of the circle ?

A. Yes, sir.

Q. It is, practically speaking, one vast room ?

A. Yes, sir.

Q. And running in a circle ?

A. Yes, sir.

Q. Did the State Mine Inspector, at the last inspection he made of the mines, think that the mine was sufficient to exhaust the gas ?

A. I don't know that he said anything about that.

Q. When the fan is stopped for some time, is it the practice there to call the men out that are working in the mine ?

A. Yes, sir.

By the coroner:

Q. How many fire-damps are there, and what are the different kinds ?

A. Well, I don't know how many different fire-damps there are ; there may be some that I never heard of, but one is all that I ever heard of.

Q. Isn't there what is commonly known as a white damp and a black damp—two different kinds ?

A. I don't know but of the one kind ; I never heard of black damp before, I only know of one kind.

Q. You say that the men were not called out of the mine while the fan was being repaired that morning?

A. No sir, they were not called out.

Q. Mr. Blair, was it not your duty to have gone down and inspected the mine that morning?

A. I had one of the miners go down.

Q. Could this explosion have occurred if the management of that mine had followed the instructions of the State Mine Inspector, and had an escapement-shaft built?

A. Yes sir, we would have had in all probability, the same explosion.

Q. How long has this mine been running there?

A. I don't know exactly how long, but I think it has been in operation about two years.

Q. Have you been foreman of the mine during all that time?

A. No sir.

Mr. Blair was excused.

James A. Grant was the next witness called, who, after having been first duly sworn, testified as follows:

Q. What is your full name?

A. James A. Grant.

Q. Where do you live?

A. Well, I live most of the time in the place where I am living now.

Q. Where is that?

A. Out there at Brush Creek coal mine; we have a boarding-house out there; sleep out there, too.

Q. What is your business?

A. Mining.

Q. Where are you working now?

A. I am working at the present time for K. C. Clay and Coal Co.

Q. Were you present at the time the accident occurred that killed Thomas Duggins and Eugene Parker?

A. Yes, sir.

Q. When was that?

A. Last Friday.

Q. About what time of the day?

A. It was about 2 o'clock on Friday.

Q. Present at the time it occurred?

A. I was about 500 feet from where it exploded.

Q. Do you know who set it off?

A. I couldn't tell who set it off. I heard, though, that it had been set off by a lamp on the head of one of the miners. I had been up there about three-quarters of an hour before that fixing some trap on that road, and went down on the north side to get some tools, and then the explosion took place; I had just left the place a short time before the explosion occurred; that is about all I know of it.

Q. How far did you say you were away at the time the explosion occurred?

A. I must have been between 400 and 500 feet away.

Q. Had you been in the vicinity at any time during the day?

A. Yes, sir; I had just been working over there in that direction, and I had been there in the morning, between 6 and 7 o'clock; I don't think it was much after 6 o'clock; I was there about an hour.

Q. What condition did you find there in the mine?

A. When I was there in the morning, I went up there to fix the track; I carried my lamp on my head, and when I got near there I took my lamp off; I didn't have any safety-lamp with me; I didn't go out there that time to look at the gas, but I thought I would try the gas, and I picked up a stick and found four inches of gas at the roof.

Q. When was that you tested the gas—in the morning?

A. Yes, sir.

Q. You first lit the stick?

A. Yes, sir.

Q. What is the reason that it did not ignite the gas then?

A. I didn't hold it high enough to ignite it; I held it up until the coal went out.

Q. How could you test the gas in that manner?

A. Well, you see I lit the stick and then kind of blew it out, and let a little coal of fire get on the end of it, and after that is done I put up that carefully toward the roof, and when it gets near the gas it will go out.

Q. Did that cause an explosion?

A. No, sir.

Q. Could it have caused an explosion?

A. No, sir, not very well.

Q. And you think you discovered 4 inches of gas?

A. Yes, sir. I think there was 4 inches of gas there in the pocket.

Q. What became of this gas after you put the lighted stick up there; it didn't burn?

A. No, sir, that wouldn't ignite the gas; it couldn't ignite the gas, the gas would put the coal out.

Q. There was no blaze to the stick?

A. No, sir; nothing but a common coal at the end.

Q. How could you tell by that there was only 4 inches of gas in the pocket?

A. Well, when the coal got near the gas, the gas put the coal out; there was no blaze to the stick.

Q. Your stick went out then 4 inches from the roof?

A. Yes, sir, it was about 4 inches from the roof.

Q. And that is the proof that you had there was but 4 inches of gas in that room or pocket?

A. Yes, sir.

Q. That was in the morning that you found the 4 inches of gas?

A. Yes, sir.

Q. Is 4 inches of gas in a place like that considered dangerous?

A. No, sir, I don't think so.

Q. When does it become dangerous?

A. It becomes dangerous when you put your light to it and set it off.

Q. Then, if any of the miners should get their light within 4 inches of the roof, there would be an explosion?

A. Yes, sir, but they couldn't get their lamps that close to the roof.

Q. Well, what do the men do when they have to get in an upright position?

A. The orders are, and they should be obeyed, when they have to get up near the roof they should take their lamp off their head and carry it in their hands, or put it some place out of danger.

Q. Is there gas at the top of the roof all the time, a certain amount there?

A. Yes, sir, I suppose there is some gas there pretty near all the time; sometimes, of course, there are more than at other times.

Q. The miners while at work are supposed to take their lamps from their heads and set it down at their side while working?

A. Yes, sir.

Q. How do these men do that you call pushers—what do they do with their lamps, carry them in their hands?

A. Sometimes.

Q. They have to use both of their hands in pushing the car, do they not?

A. Yes, sir.

Q. What do they do under those circumstances?

A. They place their lamp on a box; there is a place on the box where most of the pushers put their lamps while working.

Q. Most of them follow out that rule?

A. I think so.

Q. Where was Duggins carrying his lamp at the time of the explosion?

A. I don't know; I did not see him.

Q. Do you regard the means of exhausting the gas and supplying the fresh air sufficient in that mine?

A. It is all right as far as I know.

Q. There is but one fan for the mine?

A. Yes, sir.

Q. Do you regard that fan as a good one, one that is capable of supplying plenty of air to the mine, a perfectly first-class one?

A. No, sir, I don't think that it is exactly first-class, or I don't think that it is a very poor one; my opinion is that the fan is not large enough for the mine; that they should have a larger fan there to supply the air; I think the fan is in a tolerable good condition.

Q. How large a fan do you think they ought to have there?

A. Well, I couldn't say, but I think it ought to be larger.

Q. They have a 10-foot fan at the present time?

A. Yes, sir, it is supposed to be; I never measured it myself; I have been told that it was the size of it.

Q. Wasn't the fan stopped the day of the accident, and some of it sawed off?

A. I couldn't say; I don't know about that.

Q. Suppose you were told that this fan was stopped to have some part of it sawed off, from what you know of the fan, what part of it would you have sawed off?

A. Well, I don't know.

Q. What would they have to do any sawing for anyway?

A. Well, they might have to saw one of the wings on account of it catching on the side.

Q. Why would one of the wings get in such condition?

A. I don't know.

Q. Wouldn't it be because the fan was rather rickety?

A. Yes, sir; I suppose so.

Q. Something would have to be wrong in order that that be done?

A. Yes sir.

Q. While you were working in the mine, were you ever afraid, uneasy at any time on account of this fan being insufficient to supply air enough to drive out the gas?

A. No sir.

Q. Ever hear any of the men say that they thought it was dangerous to work down there.

A. Yes sir, but I don't think it was on account of the fan, I think they thought that the fan was all right.

Q. Did you ever hear them complain any, of the management of the mine?

A. Yes sir.

Q. What kind of complaint?

A. General complaint, such as you would hear by working with any large crowd of men.

Q. Ever hear any workmen complain of the air being insufficient?

A. Yes sir.

Q. Well, wasn't that due to the fan?

A. No sir, not always.

Q. Is that cage that you use there capable of carrying the men up and down in perfect safety?

A. Yes sir, I think the cage is in very good condition.

Q. Did you ever examine the cage?

A. No sir, I have just viewed it—just made a general observation of it, and it always seems safe enough for me.

Q. Is the floor of the cage in good condition?

A. Yes sir.

Q. What is the capacity of the cage—how many people does it carry?

A. I think it is to carry from four to six.

Q. Is that the number that it generally loaded with?

A. Yes, sir, from four to six, and sometimes there is as high as seven.

Q. You never had an accident from the cage?

A. No, sir, not that I know of. I don't think that more than seven men ever went down that cage at once.

Q. How many ought a cage of that size in perfect condition, carry out of the mine?

A. If in perfect condition, I should think it ought to carry out 10 men safely.

Q. Ten men?

A. Yes, sir.

Q. At the present time you regard it safe for only four to six men?

A. Yes, sir.

Q. Do you regard it unsafe should any more than that get on?

A. Well, I think that is enough.

Q. What is the matter with the cage?

A. There is nothing the matter with it, except that it is a little old.

Q. Has it been used in this mine since it was started?

A. Yes, sir, I think so.

Q. How long have you been employed at the mine?

A. I have been employed there ever since six weeks after it was started.

Q. Do you know whether it was an old cage before it was brought to this mine—second-handed or not?

A. We have never had any trouble with it.

- Q. Is the shaft sunk there in the usual manner?
A. Yes, sir.
Q. The cage and shaft the usual size?
A. Yes, sir.
Q. Did you ever hear of any of the men setting the gas off on purpose, just to see it?
A. Yes, sir, I believe such things have been done down there.
Q. Any person ever been hurt by it?
A. No one seriously, I don't think.
Q. Do you regard that as a dangerous practice?
A. Yes, sir, I do.
Q. Did old miners set it off that way on purpose to amuse themselves?
A. I think that it was done by the young miners, and I have heard that the old miners done so themselves.
Q. What is your regular business in the mine?
A. I do different things.
Q. Who goes around and inspects the mine in the morning?
A. I have been doing so for the last week.
Q. That is your regular business, to go around in the morning and inspect the mines?
A. Yes, sir.
Q. Did you inspect it on last Friday morning?
A. Yes, sir.
Q. What condition did you find the mine in that morning?
A. I found it in the usual condition.
Q. What is the usual condition?
A. It is where the mine is in good condition; I generally go in the mine between 6 and 7 o'clock in the morning.
Q. It is in good condition when you find no gas in the entries?
A. Yes, sir, sometimes we find a little bit; once in a while I find some in the pockets; that is there almost all the time; it is pretty hard to get that out; some of it gets around the inside of the curtains.
Q. You inspected it every morning?
A. Yes, sir.
Q. You inspected the mine about three quarters of an hour before the explosion occurred?
A. Yes, sir, a short time before.
Q. That is the time you discovered about four inches of gas next to the ceiling?
A. Yes, sir.
Q. How do you account for this explosion?
A. I don't know; it must have been by one of the men sticking their lamp to the roof, and that was the cause of the ignition of the gas; I heard that was the cause of the gas being ignited; I heard that one of the pushers set the gas off by getting his lamp up to near too the gas.
Q. Did you hear that he took his lamp and set the gas off on purpose?
A. No, sir, from what I heard he must have had his cap with the lamp up against the gas while he was pushing his car.
Q. Is there 4 or 5 inches of gas at the top of the roof of the mine all of the time?
A. No, sir, it is only once in a while that it is that way.

- Q. Does that condition exist in all mines that way ?
 A. No, sir.
- Q. What was the cause of so much gas in that entry that morning ?
 A. I guess that it was due to insufficient air to carry it out.
- Q. Did you leave it in that manner ?
 A. Yes, sir; what else could I do ?
- Q. Was the fan running that morning that you went down in the mine ?
 A. Yes, sir.
- Q. What was the reason that there was not enough air to carry the gas out ?
 A. There was not enough air.
- Q. The fan didn't supply enough air ?
 A. No, sir.
- by the jury :
- Q. You use curtains to turn the air in the mines, do you not ?
 A. Yes, sir.
- Q. Canvas curtains ?
 A. Yes, sir.
- Q. These are stationed at different entries, are they not ?
 A. Yes, sir, some of them are.
- Q. The only way out of that mine is through the shaft in which the cage is located ?
 A. Yes, sir.
- Q. Could a person climb up through the shaft ?
 A. I don't know whether he could or not, I suppose he could; I have an idea that he would find it pretty hard work.
- Q. How many men were working in the mine at the time the explosion occurred ?
 A. We had about 85 men there.
- Q. Were they all working in the mine at the time that the accident occurred ?
 A. Yes, sir; I think most of them were.
- Q. You say that there can be more than 7 men carried up in this cage at one time ?
 A. I don't think that it would be safe to put more than that on there.
- Q. It is run on the same plan as an elevator ?
 A. Yes, sir; it goes up and down like an elevator.
- Q. Are you a competent man for inspection of the mines during the morning before the men are allowed to go to work ?
 A. Yes, sir; I think I am.
- Q. Do you have to go through any examination before you are given that position ?
 A. No, sir.
- Q. Who are you appointed by ?
 A. Mr. Blair, he appoints me.
- Q. When you came out of the mine that morning, you reported it in good condition ?
 A. Yes, sir.
- Q. It was in good condition ?
 A. Yes, sir; I thought so.

EXAMINATION BY STATE MINE INSPECTOR EVANS.

- Q. How long have you been working at this mine?
- A. I have been there six weeks.
- Q. You made the statement, did you not, a while ago, that you had been employed in this mine six weeks after it was started?
- A. You must have misunderstood me; I meant that I have just been six weeks.
- Q. Where did you work before commencing at this mine?
- A. At Napoleon; that was the place that I was working at before I came to this place; I have been here only six weeks; you understood me before.
- Q. What experience have you ever had in gaseous mines before—did you work in the mine before in which there was gas?
- A. I worked a while in Frontenac, Kans., and worked a while in McAlister and then worked at Randolph.
- Q. Well, what experience did you have in those mines with gas?
- A. Didn't have any experience.
- Q. Never had any experience with gas before you came to this mine?
- A. No, sir.
- Q. Did you ever see gas in any of these mines?
- A. Yes, sir.
- Q. Did you ever ignite it from your lamp?
- A. No, sir, but I seen the gas ignited while I was at Randolph.
- Q. What was your duty at the Brush Creek mines—did you go around and inspect the mine in the morning?
- A. Yes, sir.
- Q. Would you generally find gas in certain parts of the mine in the morning during your inspection?
- A. Yes, sir; I would find gas sometimes in some parts.
- Q. You inspected the mine last Friday morning?
- A. Yes, sir.
- Q. During your inspection, did you find any gas in the place where the explosion occurred?
- A. Yes, sir.
- Q. I believe you stated, Mr. Grant, that you went there, near where the explosion took place, about three-fourths of an hour before it happened, did you not?
- A. Yes, sir.
- Q. And you found four inches of gas there on the inside of the curtain?
- A. Yes, sir.
- Q. Your method of trying the gas at that time was lighting a stick and placing it up to the gas?
- A. Yes, sir.
- Q. Isn't that something new? I have had a good deal of experience in mining and it is something new to me; I suppose that you went around in the morning on your tour of inspection, with a safety-lamp?
- A. Yes, sir.
- Q. I suppose that just before you went back there before the explosion occurred, that you did not have your safety-lamp with you?
- A. No, sir, I didn't.
- Q. You could have gotten it, could you not?
- A. Yes, sir.

Q. At the time that you went back there, don't you think now that there was more than four inches of gas there?

A. No, sir, at that time I don't think there was; should judge that the gas was about four inches from the top. I think it must have caught a body at some place else.

Q. How far is it from the surface to the face of the brushing?

A. I should guess it to be about 20 feet—somewhere in the neighborhood of 0 feet.

Q. About 20 feet?

A. Yes, sir.

Q. Was this four inches all the way, or was it just in one little pocket?

A. Yes, sir.

Q. You don't aim to say, do you, that that little four inches of gas would cause an explosion of the magnitude of the one that occurred there last Friday?

A. No, sir; no, sir. I think there must have been more gas than that. I think there must have been more gas broke out after I had made the test; I don't think that four inches of gas in that place could cause any such explosion.

Q. To the best of your knowledge now, do you know anything about gas lighting in other parts of the mine at the time of this explosion at this one point?

A. No, sir, I don't know of any anywhere else where it was lighted about the same time that the explosion took place, where the men were killed; I think that was the only place where the explosion amounted to anything.

Q. Weren't you convinced that there was more gas in the shaft at some other place?

A. Yes, sir; I think there must have been.

Q. Don't you think it was there when you went there with your stick that you was testing the gas with (that new mode of yours)?

A. No, sir; I don't think there was; I don't think there was over 4 inches of gas; I could tell exactly with that.

Q. You could tell exactly—do you think that is a proper way of trying gas—don't you think that there was more gas there at that time, and you could not tell it by the impractical way you had of testing the gas?

A. I thought that was perfectly proper.

Q. Who told you about that way?

A. Mr. Blair had spoken to me about it.

Q. Said that was the proper way to test it?

A. No, sir; he didn't exactly say so; he told me that the gas could be tested in that manner.

Q. How could you tell that there was but 4 inches?

A. I fixed the coal as I have told you, it was on the end of this stick, and then I began to raise it carefully toward the roof, and kept raising it up toward the roof, until it went out, and by that way I could tell how much gas there was in here.

Q. How far was the coal-fire from the top of the roof when it went out?

A. It was about 4 inches.

Q. You could have put that coal-fire out in some place else where there was no gas, and it would have been just as liable to go out, would it not?

A. No, sir; I don't think it would have had time to go out.

Q. How do you do that—do you take a stick and burn it until there is a coal fire on the end of it, blow the blaze out and that leaves the coal, and then you think that the gas puts the coal out?

A. Yes, sir.

Q. Well, that is something new to me. You were on the north side of the shaft at the time of the explosion?

A. Yes, sir.

Q. Did you go across right away to where the accident occurred?

A. Yes, sir, just as soon as I could light the safety-lamp, and then get down there again; it was about 50 ft. from the bottom, about 50 ft. from the left-hand opening on the air-course, and on about 40 ft. from that, right near the door.

Q. Did you hear who ignited the gas?

A. Yes, sir; I heard that one of the pushers ignited the gas; I think it was one of the men that was killed; I heard that he got his light up too near the gas.

Q. Who saw him do that—who told you that?

A. I believe Mr. Wilson saw him at the time that he ignited the gas.

Q. How was it that you came to go around and inspect the mine during the morning—was it voluntarily on your part?

A. Mr. Blair told me to go and do that; told me to go around in the morning and inspect it.

Q. You never had any experience in that line before?

A. No, sir.

Q. In fact, knew very little about gas?

A. Well, not very much.

By the jury.

Q. You make a report of your investigation after it is done?

A. I see if the mine is in good condition, and if it is not in good condition I report that.

Q. You know whether the fan was stopped that day?

A. No, sir, I couldn't say for sure; I believe that it was stopped in the morning.

Q. You reported the mine all right that morning?

A. Yes, sir.

Mr. Grant excused.

John Ford was the next witness called, who, after having been first duly sworn, testified as follows:

Q. What is your full name?

A. John Ford.

Q. Where do you live?

A. I don't live here in the city.

Q. Well, where do you live?

A. I live at Centropolis, Mo.

Q. What is your business?

A. Working in the coal mine.

Q. Who are you working for?

A. I am working for Mr. Jim Blair.

Q. He as superintendent employs you for the Kansas City Coal and Clay mine?

A. Yes, sir.

Q. Mr. Ford, you may just go on and tell the jury in your own way, all that you know in regard to this accident, speaking slowly and distinctly, so that the jury can hear you.

A. Well, I was working there when I heard the report of the explosion, and I made the remark to some one there that the gas had exploded somewhere, and I

un out to the top of the shaft, and when I got there I noticed a small door of the fan that was off.

Q. It was clear off?

A. Yes, sir.

Q. What caused it to be off?

A. That I couldn't say; I don't know what would be the cause of this being off.

Q. The fact of it being off would consequently stop the air, would it not?

A. No, sir, I don't think that it would draw in the air.

Q. That was the first time that you had noticed that door that day?

A. Yes, sir.

Q. By that door being off, that would count for the accumulation of gas in here and this explosion?

A. Yes, sir.

Q. How do you account for this door being off?

A. I can't account for how it could be off; I know there was men working here around the fan; they were fixing the fan during the morning.

Q. Do you think this door would have to be taken off, or could it have been blown off in some manner?

A. I think that the men that were working there that morning took the door off; they had to take the door off in order to get in and work at the fan, and whether they left it off when they quit work or whether it was blown off, I can't say.

Q. You think they have to take this door off in order to get in to work at this fan?

A. Yes, sir, I think they do.

Q. You don't know whether the door was put back on or not after the men had finished their work?

A. No, sir, I don't.

Q. You say the leaving of this door off would prevent the supply of air?

A. Yes, sir.

Q. It would deaden the air?

A. Yes, sir.

Q. It would supply some air to the mine, would it not?

A. Yes, sir, some, but not much of it; not near enough to drive the gas that would constantly accumulate, that is always accumulating in the mine.

Q. You have an engineer or fireman there?

A. Yes, sir, a fireman.

Q. Is it to look after the welfare of this fan?

A. I believe that it is.

Q. What time of the day was it that this fan stopped for repairs?

A. It was between 8 and 9 o'clock.

Q. In the morning?

A. Yes, sir.

Q. How long did it stop?

A. I don't think it stopped over 10 minutes.

Q. It stopped those 10 minutes for repairs?

A. Yes, sir.

Q. Don't think that it stopped any longer than 10 minutes?

A. No, sir, it didn't seem to me any longer than that; I didn't keep account by time; I am just guessing at my answer; it might have been a little more than that, but not much.

- Q. That is a frequent thing, is it not, for the fan to stop in that mine?
- A. All that I know, it frequently stopped; I don't know anything about it always stopped for.
- Q. It stopped very frequently for repairs, did it not?
- A. Well, no sir, not so often; I don't think that when it stops it always stops for repairs; it stops, of course, once in a while to get repaired.
- Q. Are you a miner?
- A. Yes, sir.
- Q. You have worked in different mines before?
- A. Yes, sir.
- Q. Know in what manner they are ventilated, etc.?
- A. Yes, sir.
- Q. And you have been mining down there at Brush Creek?
- A. Yes, sir.
- Q. Well, now, from your experience, do you regard that fan as supplying enough air for a mine of that size and capacity?
- A. Yes, sir, at the present time I think that it is.
- Q. Why at the present time?
- A. Well, the fan is not as large as it might be needed to be, after the grew larger.
- Q. How about the mine—is the mine itself in good condition?
- A. Yes, sir, I think that the mine is in very good condition—just as condition as mines are generally kept in?
- Q. What condition is the fan in, bad or good?
- A. Well, I haven't noticed the fan for some time; haven't noticed it particularly; no fan is in good condition unless it is kept perfectly closed in, and anything, everybody can stop it and start it.
- Q. Any one can start and stop the fan?
- A. Yes, sir.
- Q. You regard that as deficient in that manner?
- A. Yes, sir.
- Q. You think no one but the proper person, the fireman, should be allowed to stop or start the fan?
- A. Yes, sir.
- Q. What was the fan stopped for that morning?
- A. I think that one of the wings broke that morning, or a portion of one of the wings got out of order; I understood that was the trouble.
- Q. Who repaired this fan that morning?
- A. I believe that Jim Blair had the charge of it.
- Q. Who fixed it, do you know?
- A. No, sir, I couldn't tell you, I don't know.
- Q. Have you a machinist out there?
- A. Yes, sir.
- Q. Who is he?
- A. His name is Mike Tannier.
- Q. Did he help fix the fan?
- A. Yes, sir, I think that Mike and Jim fixed the fan.
- Q. Mike Tannier and Jim Blair?
- A. Yes, sir.

Q. And you went round there after the accident occurred, and inspected the fan and found the door down?

A. Yes, sir, I just happened to notice it as I came up; if it hadn't been for that, I don't think that I had ever looked at the fan; I wasn't inspecting it on purpose.

Q. How is this door fastened up?

A. It is just nailed up.

Q. After they get through work there they nail it up with common nails?

A. Yes, sir.

Q. It was just a side door that let the men into the fan when they wished to repair it?

A. Yes, sir, that is what it was for.

Q. When opening the door the men had first to take the nails out?

A. Yes, sir.

Q. Is this door taken off and put on often?

A. This was the first time I ever noticed it being off; I never knew of it being off before; it had always been nailed up promptly after things had been fixed all right on the inside.

Q. Is there much pressure brought to bear on this fan from the inside?

A. How do you mean?

Q. Is the air heavy enough inside to blow this door off, if not properly nailed on?

A. Well, in my opinion, it would take a pretty heavy blast of air to blow off the door; I don't see how it could be heavy enough to blow it off, I don't hardly think it could.

Q. There is nothing inside the fan that might strike the door and loosen it in that manner?

A. No, sir, I don't think there is.

Q. Do you regard the explosion as sufficient to jar the door off?

A. I don't see how it could, if the door had been fixed on properly; I don't think that the jar of the explosion would have had any effect on it whatever; of course, if the door had just been hanging there it might cause it to fall off.

Q. What is your opinion as to the reason that it is off?

A. I don't know; I couldn't say in regard to that; it may have been left and not put on by the men when they quit working; I don't know in what other manner it could have gotten off.

Q. How far was this explosion from the fan—from this door that you speak of, on the fan?

A. It must have been 350 or 375 feet; yes, it must have been more than that; it might have been as high as 600 feet.

Q. Did you notice any effect from the explosion outside of the mine anywhere round the shaft of the mine?

A. No, sir, I did not; the explosion in the mine was terrific, but I noticed no particular signs of the explosion on the outside; I don't think that it affected anything much on the outside; it tore up things considerably on the inside.

Q. How many men were injured in the explosion?

A. Well, there was two killed outright, and about 5 or 6 that was injured, and I think that several of them are seriously injured, they seem to be in a pretty bad condition; there was a good many that was slightly injured; I don't remember just how many altogether were injured.

Q. You have no idea who it was or what it was that set the gas off?

A. No, sir, only what I heard.

Q. Did you ever see any one down in that mine set the gas off on purpose—see them do it deliberately?

A. No, sir.

By the jury:

Q. How many men were working in the mine at the time the explosion occurred?

A. There was somewhere in the neighborhood of 70 working in the mine.

Q. About 70?

A. Yes, sir.

Q. When you noticed the door of the fan being off, was it lying far away from the fan?

A. No, sir, it was just laid over at the side of the fan.

Q. If it had been blown off, would it have been lying in that direction?

A. I should think it would have blown further out.

Q. It looked as if it had been carefully laid down there?

A. Yes, sir.

Q. Didn't look as if it had been blown off?

A. No, sir.

Q. When you first saw the door your opinion was that they had left the door off, and that had allowed the gas to accumulate in the mine and cause the explosion?

A. Yes, sir, that is my opinion; in fact, at the time that I noticed that it had been blown off, I couldn't really say that I thought at first that it had been left off, but it looked that way at the time; I picked the door up as soon as I could, and then I nailed it on again, so that everything would be all right.

Q. If it had been blown off by the force of the explosion, don't you think that it would have been further away from there?

A. Yes, sir.

Q. Did you examine the nails to see if they had been twisted?

A. No, sir, I did not examine them.

Q. Was there anything whatever about the door that indicated to you that it had been blown off by the force of the explosion?

A. No, sir, I can't say that there was.

Q. The door was lying right by the side of the fan?

A. Yes, sir, pretty close to the fan.

Q. You never this fact of this door off before?

A. No, sir.

Q. How far is this door from the fan itself?

A. It is about 6 inches from this fan.

Q. This fan sits on the ground?

A. Yes, sir, it is fixed in a kind of a little shed.

Q. And is located near the top of the shaft?

A. Yes, sir.

Q. On what side of the shaft is the fan located?

A. It is located on the east side of the shaft.

Q. Do you know how old this fan is?

A. No, sir, I do not.

Q. Do you know whether it was seconded when brought to this mine?

A. No, sir.

Q. It had to be repaired constantly?

A. Well, quite frequently.

- Q. The fan is run by steam?
- A. Yes, sir.
- Q. Is its running gear in good condition?
- A. Yes, sir.
- Q. It is one of those common revolving fans, is it not?
- A. Yes, sir.
- Q. There is no suction?
- A. No, sir.
- Q. You work down in the mine yourself?
- A. Yes, sir.
- Q. How long have you been working there?
- A. I have been working there from the time that it was opened.
- Q. Do you know whether the gas has been bothering the people that worked in the mine much, here lately?
- A. Yes, sir, it has been bothering the people a good deal here in the mine.
- Q. Has the gas ever accumulated in your quarter where you were working to any great extent?
- A. Yes, sir, I have known it to be quite dangerous.
- Q. Have you ever known it to be dangerous for a man to go into the mine?
- A. Yes, sir, I have.
- Q. Was it while this fan was working?
- A. I can't say whether the fan was running or not; there is one thing sure, that if the fan was properly run all the time, kept running all the time and no stops, there would not be as much gas in the mine as there has been; if the fan had been properly run I think there would have been very little gas in the mine; it would have kept it pretty well out.
- There was one thing that I hardly think that was kept right, that was the curtain; I think they could have been bettered in some places. If they had complied with all of these rules, I don't think that the gas could have accumulated in and one place in large quantities.
- Q. Who had charge of all this?
- A. Mr. Blair was in charge out there; I suppose he was the one that should attend to all such things as that.
- Q. He had foremen under him, did he not?
- A. Yes, sir.

EXAMINATION BY STATE MINE INSPECTOR CHAS. EVANS.

- Q. How long have you been working there?
- A. I have been working there ever since the mine was sunk.
- Q. How long have you been working on top? Have you been working on top?
- A. Yes, sir, I have been working on top about three weeks.
- Q. You were working in the mines before that?
- A. Yes, sir.
- Q. Of your own personal knowledge do you know anything about the south entry, anything about the accumulation of gas there?
- A. Yes, sir.
- Q. Is there much accumulation of gas in that entry?
- A. Yes, sir, there has been an accumulation of gas there all the time.
- Q. More so than any other part of the mine?
- A. Yes, sir, I think it has been for the present time; two years ago we had more to the north.

Q. Two years ago you had more in the north than in the south entry?

A. Yes, sir.

Q. That afterward changed to the south?

A. Yes, sir, we have not been bothered with the gas in the north like we used to be; it seems to have shifted over to the south entry; didn't used to have much there.

Q. Of your own knowledge, do you know of any effort being made to remove this gas?

A. Yes, sir, they tried to keep the air going through there all the time; they changed the curtain; the curtains were so arranged so that the air could strike it in such a manner as to drive the gas out of that entry.

Q. Was there any space left over the top of the door or the curtain, so some of the air could travel close to the roof?

A. No, sir.

Q. Were you working there when Mr. Russell had charge of the mine?

A. Yes, sir, I was.

Q. Did you notice Mr. Russell doing any work there at the time?

A. Yes, sir, I was under Mr. Russell.

Q. Did Mr. Russell keep the gas pretty well out of the mine—keep the air going pretty thoroughly through the mine?

A. Yes, sir, he seemed to have everything in pretty good condition.

Q. Did you notice if he ever left any space over the top of the doors or curtains?

A. Yes, sir.

Q. What was the reason for doing that—so that the air could travel near the roof?

A. Yes, sir.

Q. The curtains, under Mr. Blair's management, were not so arranged so that the air could pass over the top of the curtain?

A. No, sir.

Q. The air would travel below instead of at the top?

A. Yes, sir.

Q. Air generally travels high, does it not, especially in a mine like that?

A. Yes, sir, I believe that it does.

Q. I believe you stated that you had been on the outside for the last two or three weeks?

A. Yes, sir.

Q. You were where you could see the fan during that time?

A. Yes, sir, part of the time.

Q. While you have been on top how often have you noticed this fan to be out of fix?

A. Well, to the best of my knowledge, this is the first time that I ever saw this door off the side of the fan; this is the first time that I ever seen it left off.

Q. That is the only time you remember of its ever being left off?

A. Yes, sir.

Q. What made you go and examine the fan after the explosion occurred?

A. Well, I happened to be around the shaft, and happened to notice that the door was off; I did not go to the fan to examine it on purpose; it was just by accident that I happened to notice that the door had been left off the fan.

Q. Did you put the door back on immediately ?

A. Yes, sir, it was put on right away.

Q. Had you been working around the fan that day—working around the fan while it was being repaired ?

A. No, sir, I did not.

Q. Did you notice the door being off soon after they had finished repairing the fan ?

A. No, sir, I didn't notice before that the door was off, and run up there, and when I did I glanced at the fan and seen that the door was gone. That was the first time during the day that I had noticed that there was anything wrong about there.

Q. Had anyone told you during the day anything about the door being left off—spoke to you about it ?

A. No, sir.

Q. Do you know how fast the engine was running—how many revolutions it was making per minute ?

A. I oiled the engine, and I noticed that it was making very good time.

Q. Do you know what she generally runs ?

A. No, sir, I do not.

Q. Does it keep running the same all the time ?

A. I don't know ; I don't know exactly what she generally runs, but I suppose that she runs about the same all the time ; I should that they would have have to keep her that way.

Q. The fan is located about 12 feet from the shaft ?

A. Yes, sir.

Q. That is to the east ?

A. Yes, sir, to the east.

By the jury :

Q. You say that the fan is located 12 ft. back from the shaft ?

A. Yes, sir.

Q. And from that place it supplies air to the mine ?

A. Yes, sir.

Q. Is that the only fresh air supply to the mine ?

A. Yes, sir.

Q. What caused you to stop working down in the mine ? Was it because you thought it safer to work on top than down in the mine ?

A. Well, I can't say but that I did ; it seems safer up on top than it did down there in the mine.

Q. Were your wages the same while working on top as they were while working down in the mine ?

A. Yes, sir, they were, only I had to work a little longer on the day.

Mr. Ford excused.

W. H. Duggins was the next witness called, who, after being duly sworn, testified as follows :

Q. What is your full name ?

A. W. H. Duggins.

Q. Where do you live ?

A. I live here, in Kansas City, Mo.

Q. What street and number ?

A. *In fact I couldn't tell you ; I have just lately moved in there ; it is out on 24th street ; it is down near the electric line.*

- Q. Well, don't you even know what street you are living on?
- A. Well, it is about two blocks east of 24th street, on Vine.
- Q. Near 24th and Vine?
- A. Yes, sir.
- Q. What is your business?
- A. I am a miner.
- Q. You work for the mining company at Brush creek?
- A. Yes, sir.
- Q. Were you working there last Friday?
- A. Yes, sir, I was there at work.
- Q. Were you working there at the time the explosion occurred?
- A. Yes, sir.
- Q. What time did you go down—what time did you commence work that morning?
- A. We commenced that morning about 7 o'clock.
- Q. You worked in there all the morning?
- A. No, sir.
- Q. How long did you remain there?
- A. I remained in there until 8 or 9 o'clock; I didn't feel very well, and I came out; I was there about 8 o'clock; came out about 8 o'clock, I guess.
- Q. You were about one hour in the mine that day?
- A. Yes, sir.
- Q. What were you doing there?
- A. I wasn't doing anything; I was sitting around, ready to go to pushing.
- Q. Why didn't you go to work?
- A. Well, there seems there was a little trouble about the men going to work; I believe there was a good deal of dissatisfaction that morning.
- Q. What was the trouble about?
- A. Well, I couldn't exactly tell you how the trouble originated; it was about some work that the company wanted the men to do as they came out of the mine.
- Q. Well, what was it they wanted them to do?
- A. I believe it was that some of the men should bring out the last box.
- Q. When the men came out from work they should bring a box of coal with them?
- A. Yes, sir.
- Q. And how did that cause trouble?
- A. Well, some of the men refused to do that when the bell rang for them to quit.
- Q. They have regular men to push the cars out?
- A. Yes, sir, and that is the reason that the men made a kick about pushing the last box out; they claim that was not their duty, that the men who had the contract should see that the cars were all gotten out, and not them.
- Q. Duggins, who was killed down there, was a brother of yours?
- A. Yes, sir.
- Q. Well, Mr. Duggins, you may just go on and tell the jury all that you know in regard to that accident.
- A. Well, it was caused from an explosion of gas, and this gas that caused that explosion was not properly looked after, very badly looked after; in those mines are more or less gas, and it is in nearly every roadway, and in nearly every roadway the air is not sufficient. This place where my brother got killed, one generally finds a good deal of gas in this place and it is not properly kept out; most any

time you can find generally from 4 to 6 inches in there, and that day I was on top, I couldn't tell just how much gas there was in the road; there must have been a great deal in there, because the explosion caused a very heavy shock on top of the ground, and it must have been a terrible explosion down in the mine.

Q. Did you ever work in there with your brother?

A. Yes, sir, I have been working in there with him all the time.

Q. What were you doing there—what was your business?

A. We were pushing.

Q. Pushing together, were you? pushing the cars that you take the coal out in?

A. Yes, sir.

Q. While you have been working in that mine, did you ever hear of his igniting the gas, for the fun of it?

A. No, sir; that is all wrong; I know that he would not do such a thing; you couldn't make me believe it; he was afraid of gas, he was greatly afraid of it; he has often spoken to me about the danger of it; he was very much afraid and would not have lit the gas for fun, and I have always cautioned him, and I have cautioned others about being careful about lighting the gas; he would always be afraid when he seen any one fooling about the gas; he did not even like to talk about the danger.

Q. What would you say if you heard anyone make the statement that he had been fooling with the gas and setting it off, and that parties had cautioned him against the danger—that he had lit the gas at different times for fun?

A. I would think that it was not so.

Q. You know him to be very cautious while about gas?

A. Yes, sir.

Q. What do you think about the fan they have there of the exhaustion for the gas and supplying the mine with fresh air?

A. Well, I don't think very much about it; I think that it is a very poor concern, it gets out of order so much; they are always trying to repair it in some manner, and half the time while they are repairing it they never call the men up out of the mine. Now, this fan is of a great deal more importance than some people think it is; you must remember that all these men that are working down there depend upon this fan for the air they get, and the air to drive the gas out, and that keeps the air from accumulating and causing an explosion in the mine.

It is nothing more than an old rattle-trap. In the first place, if the fan was in good condition, it is not large enough for a mine of that size; they need about a 14-ft. fan there at that mine; the fan and the shaft are in very bad shape—in fact, most all of the arrangement, from the shaft down to the way the air is arranged, is in very bad shape.

Q. Is in bad shape because you don't get the air regularly?

A. Well, it is in bad shape partly on that account, and in a good many places because it is not stopped up right.

Q. There is a good deal of the air that is wasted?

A. Yes, sir, a good deal is wasted.

Q. Is that on account of the bad arrangement of the curtains?

A. Well, partly, I think; I can't tell you much about it—I don't know that it is in bad condition.

Q. You mean to say that the air is wasted by being allowed to go in out-of-the-way places, and in places where it is not needed, instead of where it is needed?

A. Yes, sir.

Q. To remedy this they would have to stop up certain places, would they not—make a change in the door and curtains?

A. Yes, sir, I think so; a man that understands his business there, as the foreman of a mine in all cases should, ought to know how to handle that business.

Q. You make stops with board partitions and curtains?

A. Yes, sir, but what we have out there are very poor; they are allowed to get in very bad condition; they are not placed where they ought to be; lots of the air is wasted in wrong places, badly distributed; it could be made a good deal better.

Q. How high is the mine? How much space have you in the height there?

A. Well, in some places $2\frac{1}{2}$ feet, and in other places 3 or 4 feet; I expect it would average 3 or 4 feet.

Q. The average height would be about $3\frac{1}{2}$ feet?

A. I think so.

Q. Was the depth greater at the point where the explosion occurred than where they usually take out the coal?

A. Yes, sir, there is more height in the roads, it is higher there than any place where they take the coal out; when you get back closer to the coal, there is not so much depth.

Q. Well, about how many feet in depth is it there?

A. About 4 feet there, I should think.

Q. The only way for a man to escape from that mine in case of fire, is by the one shaft?

A. Yes, sir.

Q. Do you regard that as sufficient for that purpose?

A. No, sir, I regard it as very insufficient; in case of a bad explosion and the damp that would follow, that it would be pretty hard for a man to get out of there and save his life and everything else.

Q. When pushing your cars along there, do you always carry your lamp in your cap?

A. Generally; yes, sir.

Q. Leave your cap on while pushing?

A. Sometimes we do; it is according to where we are at; when we are pretty close to the roof, we generally take our lamps off our caps, and sit on the car, and when we do that, we are generally safe.

Q. Was your brother in the habit of doing that?

A. Yes, sir, he was very careful about doing that.

Q. Did your brother ever set the gas off by accident?

A. No, sir, I don't think that he ever did.

Q. Do you ever have any considerable amount of gas to break out from some crevice or hole at certain times?

A. Yes, sir.

Q. They are generally in the roof?

A. Yes, sir.

Q. Do you know whether your brother had his lamp on his head at the time this explosion occurred, or not?

A. I don't know; I couldn't see him; I wasn't down there, but I hardly think that he would leave his cap on, as I have told you before he was very careful while about the gas.

Q. Do you know of anyone that saw who ignited this gas, and if it was ignited by any person?

A. No, sir, I don't think that I did; I felt pretty bad after the accident occurred, and I didn't have much time to talk about what was the cause of the explosion.

Q. Your brother was perfectly sober that morning, was he not?

A. Yes, sir.

Q. He didn't speak about coming out of the mine with you, did he?

A. No, sir.

Q. Have you heard much talk among the miners in regard to the mine being unsafe—dangerous for a person to work down there?

A. I have heard different miners say that they thought that it was dangerous to work there; there has been a good deal of talk about it.

Q. Was there ever any formal complaint made to the foreman?

A. Yes, sir, I think there was.

Q. What did the foreman have to say in regard to these complaints?

A. I don't know; I know that men went to him and told him that the mine was in a bad condition—that it was unsafe.

Q. Was the fan stopped a good deal?

A. Yes, sir, quite a bit.

Q. Always stopped for repairs?

A. Yes, sir, most of the time it was stopped for repairs.

Q. What else would be the cause of it stopping?

A. Well, sometimes it would stop on the account of it being out of order or something of that sort.

Q. Do you know how long this fan has been in use?

A. No, sir, I do not.

Q. Do you think that the fan would supply enough air, if the air of the mine had been properly distributed?

A. I don't know, there might have been.

Q. Did you go down in the mine after the accident occurred?

A. No, sir, I did not wish to go down in the mine after the accident occurred.

Q. How long was it after the accident before your brother was brought out?

A. I couldn't say; I should think that it was at least a half an hour after the explosion took place.

By the jury:

Q. Do you know the place where he was killed?

A. I didn't know the place where he was killed until after he was brought out.

Q. You know the place description?

A. Yes, sir.

Q. Is that considered a dangerous portion of the mine?

A. Well, there is a good deal of gas that accumulates there.

Q. Was your brother pushing a load out at the time the explosion occurred?

A. I believe that he was.

Q. Don't know whether he had his lamp on his head or not?

A. No, sir, I do not.

Q. Did your brother ever seem to think that it was dangerous to work down there?

A. Well, he was always like me: he always thought that there was a amount of danger; he was always afraid of the gas; 'm

Q. Was there much gas in the mine that morning?

A. Yes, sir, there was always a good deal of gas in there.

Mr. Duggins excused.

The remainder of the testimony in this case is very similar to the foregoing, and for lack of space the entire testimony cannot be published.

The following is verdict of the coroner's jury:

We, the coroner's jury, duly impaneled and sworn to diligently inquire into and true presentment make as to how, by whom or by what means Thomas Duggins and Eugene Parker, whose bodies we have viewed, came to their death, do find, from the evidence produced before us, that the said Thomas Duggins and Eugene Parker came to their death by and from an explosion in the mine of the Kansas City Clay and Coal Company, caused by the ignition of gas.

We further find that the said explosion was caused by a collection of gas, through failure on the part of the company to provide suitable air-courses for the proper distribution of the air to all parts of the mine, and we censure said company for not complying with the statutes regarding mines, and suggest that the proper officials take such steps as the laws of the State warrant.

J. A. HATCH, Foreman.

R. H. CALVERT,

T. Q. PERRIN,

J. K. MORRISON,

HARRY ALTMAN,

J. P. THOMAS.

JOHNSON COUNTY.

Hugh Clifford, a miner working at Joseph Murley's mine, was killed by a fall of roof February 16, 1894.

Coroner's verdict was as follows: "Killed by his own negligence."

It appears that the foreman of the mine warned deceased of his danger, and instructed him to put in more props. This he neglected to do, although the piece of loose soapstone in the roof was pointed out to him.

MACON COUNTY.

Anton Fatrib, a butcher by trade, but, at the time of the accident, employed as a miner by the Kansas and Texas Coal Co., at its mine at Ardmore, met with a fatal accident November 7, 1893. About this time I was inspecting the mines at Bevier. Hearing that an accident had occurred at Ardmore, I went over there and was present at the coroner's inquest, and the following day examined the place where deceased was killed. Part of the testimony taken before the coroner is misleading, from the fact that the witness, Mr. Kube, is a German, who understood but little of the English language. I asked him how long deceased had been working under-ground? Mr. Kube replied: "Twelve years." I afterward learned that Mr. Kube understood the question as applying to his own experience in the mines, instead of to that of the deceased. I also learned that the deceased was a butcher

by trade, and that if he ever worked in a mine previously it must have consisted of very limited periods. Certain, however, it is, that the day of accident was also the first day of deceased's employment in this mine. The place given to this man to work in had been standing idle for a period of four weeks, and in meantime the roof had drawn and become heavy and to a greater extent than would be experienced if same had been worked continuously. The deceased, at the time of the accident, was engaged in mining off an old standing shot, and as he was removing the coal, he was also making much looser the already loose rock above. Not being aware of his danger by reason of his lack of experience in coal mining, the fall came and he was caught.

While the Coroner's verdict was, "that the deceased came to his death through his own carelessness," and the company blameless for any direct cause of the accident, yet there is a question of how far this thing of employing incompetent and inexperienced men to work in a place like a coal mine can go; where, at best, the conditions are extra hazardous, and the requirements for the keenest observation of practical eyes are ever present. Is it not bad enough to require an old and experienced miner, well acquainted with the mine, to work in a place considered dangerous, with the promise of extra pay; but when such places in a mine are avoided by the practical miner, is it not a shame to take advantage of the eagerness of the poor man out of work to secure employment, to place him in a trap, where the chances are that it may cost him his life? When the inexperienced and the novice in underground work are placed in dangerous rooms or places, it becomes nothing less than criminal.

Robert Evans, a coal miner, 43 years of age, married and the father of three children, was fatally injured Sept. 27, 1893. The deceased was employed at the mine of the Kansas and Texas Coal Company, at Bevier, and, while preparing to go to work, a fall of roof occurred, killing him.

Coroner's verdict, "accidental death." The duties of the Mine Inspector requiring him to investigate the cause of fatal accidents. I visited the mine a day or two after the accident, and upon an examination of the room in which the accident occurred (the room not having been worked in the meantime), I found it well timbered, and a number of props close at hand, ready for use if needed. Upon inquiry I learned that the deceased had fired a shot about half an hour previous to the accident, and as the practice at that time was to loosen the coal by shooting off the solid, he made this kind of shot, with the result that the roof was shattered in such way as to leave it in the condition of being ready to fall without the least warning. The deceased was

one of the most practical miners in the State, and was well aware of the result of shots like the one he made, and upon return to his room took the precaution of sounding the roof carefully with his pick, as he advanced to the face, and it was while engaged in this sounding that the roof fell with fatal effect.

This is another proof of the dangerous practice of mining coal by blasting off the solid. This method of mining was introduced in this State, it is claimed, by the "scab" laborers brought here to defeat the efforts of home miners in the maintenance of living prices. The direct result has been to lower the standard of the original and experienced miner to the low level of the "scab" or inexperienced miner.

Robert Christian (colored), about 24 years of age, and at the time of the accident employed at Mine No. 46 of the Kansas and Texas Coal Co.

Coroner's verdict: "Accidental death caused by his own carelessness."

The deceased, in company with two other men, was returning to work after the usual working hours. He opened the wrong door at the surface landing of the shaft, stepped into the open side of the shaft, falling 142 feet and landing on top of the cage. His neck was broken by the fall. From the evidence taken before the coroner's jury, and which I have gone over carefully, it appears that deceased and his associates were of the number of negroes brought from Alabama to take the place of striking miners. It is quite clear that they were unacquainted with mining shafts, and likely never saw one till brought to this State. The most surprising thing in connection with the coroner's inquest is the fact that the Coal Co.'s attorney conducted the investigation. The coroner troubled himself to ask one question out of the 85 asked during the inquest, and answered one as follows:

Mr. Thompson (attorney of the Coal Co.).

Mr. John A. Dale (coroner).

Question by Mr. Thompson—Mr. Dale, this will cover the points?

Mr. Dale—I think so; yes, sir.

RANDOLPH COUNTY.

Cal. Denny (colored) was killed September 12, 1893. Deceased was employed by Caffery & Baker as a driver in their newly-opened drift mine.

The verdict of the coroner's jury was as follows: "Death accidentally." From the testimony of witnesses before the coroner's jury, several of whom were experienced miners, working in the mine and familiar with it, gave it as their opinion that the roof at the point where the deceased was killed was untimbered; that it was a bad roof.

One of the witnesses testified: "In my opinion, as an experienced miner, the roof was not a good one; it could have been made a safe roof if the proper number of props had been used. It is a rotten black slate roof, but could have been cross-barred and lathed so that it would have been safe. The only safe way of doing when there is a rotten slate roof in the mine is to prop it up."

In this case we find an ignorant, inexperienced man, employed as a driver, whose duty required him to pass and repass continually under a roof pronounced by experienced men as unsafe, and that could have been made safe by proper timbering. Is it not about time that some legislation be enacted requiring mine owners to employ only experienced men in the hazardous work of coal mining?

Silas Jones and Erastus Edwards (colored men), employed to mine coal at the mine of John Breckenridge, were instantly killed November 3, 1893, by a fall of roof. The verdict of the coroner's jury was as follows: "Unavoidable accident." The testimony before the coroner's jury goes to show that the deceased were working in a room together, and at about noon-time fired what is known as a "windy shot," the result of which was the displacement of timbers in the room. It is supposed that these men, returning to the room after dinner, instead of immediately replacing the props knocked out, sat down and began loading the coal instead of making the roof safe.

When this department was notified of the accident, I at once visited the scene of the accident and made a thorough investigation as to the causes leading to the same. The mine in which the accident occurred had been standing idle for about a month, owing to the strike on the part of the miners for an advance in the price of mining. In the meantime the operator had secured a number of Alabama negroes to take the place of the striking miners. Among the number were the two negroes now deceased. From representations made to me, it was plainly shown that each one of the unfortunates had mined coal some time previous to their arrival in this State, and by those acquainted with them previously, considered practical miners. However, to my mind they displayed precious little practical knowledge of the nature and character of a shale roof, or the mining of coal like that which they were working in, as indicated by the manner in which they were caught and squeezed to death.

The accident occurred on the second day after going to work in the mine. The deceased fired a shot, went to dinner and returned to their room; they could not avoid noticing the effects of the overcharged shot, as the coal was blown in all directions and five or six

props knocked out. The practical miner, with such added warning before him as this, would have exercised extraordinary precaution before attempting to go under a roof which had not only been badly shaken up by an unusually heavy shot, but deprived of all of its support. The room had been well timbered, with plenty of props close at hand, and to deliberately expose themselves to the danger so apparent to the practical miner, displayed dense ignorance or a reckless indifference, unfitting them as proper parties to work a mine when the lives of so many worthy men are at stake.

The accident is a combination of two evils—first, the dangerous and impracticable method of mining off the solid; second, the introduction of foreign labor into coal-fields, the nature, character and mining of which are so different from their accustomed observation and methods.

RAY COUNTY.

Dan George, a miner, working at mine No. 4, Richmond and Camden Coal Co., was killed January 8, 1894, by falling down the shaft.

Coroner's verdict. We, the jury, find that Dan George came to his death by accidentally falling down in pit No. 4, owned and operated by the Richmond Coal Company.

It appears that the cage was descending from the tip-house to the surface landing to take on miners there, and then waiting to go down. The deceased came along, passed the men waiting for the cage, and stepped over in shaft before cage landed. It looks like a case of extreme carelessness on part of the deceased.

VERNON COUNTY.

William P. Green, a coal miner employed at Mine No. 8, Central Coal and Coke Co., met with a fatal accident June 8, 1893. The coroner's verdict was as follows: "Accidental death."

It further appears that deceased had removed the props from under a large piece of rock, and while working under the same, it dropped out and killed him.

John Graham, pit-boss of the Bedford Coal Co., was fatally injured July 14, 1893. No inquest held.

The deceased was injured about 2 p. m. and lived until 10 p. m. same night, being sensible to the last. At the time of the accident the deceased was engaged in the act of pushing a loaded car off the cage at the bottom of the shaft; engineer having signaled to hoist, he was caught by the cage before he had time to clear it.

Jacob Fain, pit-boss at the mine of Geo. W. Huselton, met with a fatal accident Feb. 17, 1894. The verdict of the coroner's jury, was

"accidental." The deceased, at the time of the accident, was working on a pillar-shot, having about mined it off, with his partner engaged near by in loading the coal, when a large rock fell without warning. The deceased had examined the roof a short time before. The deceased, although considered the pit-boss, yet owing to the limited force at times working in the mine, assisted in mining.

CARBON CENTER, Mo., February 23, 1894.

We, the undersigned miners, were working in the Huselton mine when the accident, resulting in the killing of Jacob Fain, pit-boss, occurred. The accident was caused by the falling of a piece of rock from the roof, while Mr. Fain was working on a pillar-shot.—We consider the accident one for which no blame can be attached to any one. The mine being well-timbered, and all care having been taken to insure safety.

E. M. MCCRAY,
F. BRYANT,
JOHN NEIL,
H. A. HARFORD,

J. W. THOMAS,
WM. SHEPARD,
J. J. FORD,
O. W. WILLIAMS.

TABLE IX—SHOWING ACCIDENTS IN COAL MINES, BY COUNTIES, FOR THE YEAR ENDING JUNE 30, 1894.

AUBRAIN COUNTY.

Name of employer.	Name of employee.	Occupation.	Am't of insurance.				Nature of accident.	Coroner's verdict.
			Was the injured party insured?	Yes	No.	No.		
			Fatal	1	1	1		
			Non-fatal	1	1	1		
			No. of children	1	4	1		
			Married	1	4	1		
			Single	1	4	1		
			Age	17	1	1		
Vandalia Coal Co.	Burge, John J.	Miner	38	1	1	1	Fall of roof	His own negligence.
Totals	Williams, W. F.			1	4	1	Fall of coal while undermining	

BARTON COUNTY.

The Wear Coal Co.	Cole, Albert C.	Miner.	28	1	1	1	Fall of rock at face of room	Inquest unnecessary
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BATES COUNTY.

The Rich Hill Coal Co.	Bruce, L. F.	Miner.	30	1	2	1	Fall of slate, breaking leg.	Inquest unnecessary
F. A. Raney Coal Co.	Butte, C. N.	Operator	34	1	1	1	Fall of soapstone while engaged setting prop.	
The Rich Hill C. & M. Co.	Jordon, Joseph.	Trapper	14	1	1	1	Squeezed between cars at bottom of shaft.	
J. N. Flansberg & Son	Meals, Owen.	Driver	20	1	1	1	Car-door came open, bruising one leg.	
Totals	Summers, Cyrus	Miner.	22	1	1	1	Fall of roof.	See remarks
				2	3	3		

RECAP BY COUNTY.

Central Coal & Coke Co....	Koch, John.....	Miner.....	25	1	1	1	1	1	Cartridge caught and exploded in removing.
James Robertson.....	Lee, Harry.....	".....	28	1	1	1	1	1	Fall of roof.
Wm. Rusk.....	Rusk, O. P.....	M. and farmer.....	22	1	1	1	1	1	"
Harry Ward.....	Taylor, Henry.....	Miner.....	30	1	1	1	1	1	Fall of cage; rope slipped drum, and cage fell
Central Coal Co.....	Worman, R.....	Teamster.....	38	1	4	1	1	1	Fall of roof; failed to examine roof.
Totals.....			38	3	2	5	5	5	

JACKSON COUNTY.

Kansas City Clay & Coal Co....	Duggins, Frank.....	Pusher.....	32	1	1	1	1	1	Explosion of gas.
".....	Fuller, Henry.....	Miner.....	33	1	1	1	1	1	"
".....	Parker, Eugene, col'd.....	".....	40	1	1	1	1	1	"
".....	Sattler, W.....	".....	28	1	1	1	1	1	"
".....	Terry, Steve.....	".....	44	1	1	1	1	1	"
".....	Wilson, O. L. D.....	".....	2	4	2	4	6		"
Totals.....			2	4	2	4	6		

Co. censured for neglect.
Same.
Same.
Same.

JOHNSON COUNTY.

Joseph Murley.....	Clifford, Hugh.....	Miner.....	42	1	1	1	1	1	Fall of roof.
									His own negligence.

MACON COUNTY.

Kansas & Texas Coal Co....	Christian, Robt.....	Miner.....	34	1	1	1	1	1	Fell down shaft.
".....	Collett, D. A.....	".....	43	1	4	1	1	1	Fall of rock from roof, back injured.
".....	Evans, Robert.....	".....	43	1	3	1	1	1	Fall of rock.
".....	Patrib, Anton.....	".....	37	1	1	1	1	1	"
Loomis Coal Co.....	Jones, Walter.....	Shoveler.....	17	1	1	1	1	1	" badly injured.
Bevier Black Diamond C Co.....	Powell, John.....	Miner.....	33	1	1	1	1	1	Premature blast, burned about the breast.
Kansas & Texas Coal Co....	Rose, Thos.....	".....	38	1	1	1	1	1	Fall of rock.
".....	Stafford, John.....	".....	25	1	1	1	1	1	"
Loomis Coal Co.....	Stott, Joseph.....	Roadman.....	60	1	4	1	1	1	" both legs broken.
Totals.....			5	4	12	6	3	9	

Accidental death.
Accidental death.
Caused by his carelessness.

ACCIDENTS BY COUNTIES—Continued.

Name of employer.	Name of employee.	Occupation.	Am't of insurance. Was the injured Yes party insured? No	Nature of accident.	Coroner's Inquest.
			Fatal.		
			Non-fatal		
			No. of children		
			Married		
			Single		
			Age.....		

PUTNAM COUNTY.

Mendota Coal & Mining Co	DeMack, Thos	Laborer	68	1	1	Fall or slip, breaking his arm.
"	Parker, Frank	Miner	15	1	1	Fall of rock, breaking hip and left leg
Totals.....				1	1	2

RANDOLPH COUNTY.

Caffery-Baker Coal Co	Bagby, Daniel	Miner	44	1	1	After-damp explosion
Brethrinridge, John	Bean, Wm	"	30	1	1	Premature explosion of blast
Caffery-Baker Coal Co	Denny, Ch	"	35	1	1	Fall of roof
John Brethrinridge	Edwards, Ernest	"	39	1	1	"
Caffery-Baker Coal Co	Hopkins, E	"	41	1	1	After-damp explosion
John Brethrinridge	Jones, Shas	"	45	1	1	"
Caffery-Baker Coal Co	Kran, Mirc	"	30	1	1	"
"	Viguary, Gus	"	30	1	1	"
L. B. Williams	Walker, Charley	"	42	1	1	Fall of rock, leg broken
Totals.....			72	6	6	9

Death accidental.
Unavoidable accident.
Unavoidable accident.

RAY COUNTY.

Richmond & Camden C. Co	George, Dan'l	Miner	35	1	1	Fell down shaft
Kansas & Texas Coal Co	Meyers, Robt	"	33	1	1	Caught by cage; right arm broken
Totals.....			1	1	1	1

Accidental.

VERNON COUNTY.

Vernon Coal Mining Co Geo. H. Huselton Bedford Coal Co Central Coal & Coke Co Totals.	Crosby, O. Fair, Jacob Graham, John Green, William Totals.	Miner F't-Doss Miner Totals.	30 33 40 45 Totals.	1 2 1 1 4 Totals.	1 1 1 1 1 Totals.	1 1 1 1 1 Totals.	Burned with gas Fall of roof Caught by the cage at bottom of shaft Fall of rock Totals.	Accidental No Inquest Accidental death
Vernon Coal Mining Co	Crosby, O.	Miner	30	1	1	1	Burned with gas	Accidental
Geo. H. Huselton	Fair, Jacob	F't-Doss	33	2	1	1	Fall of roof	No Inquest
Bedford Coal Co	Graham, John	"	40	1	1	1	Caught by the cage at bottom of shaft	Accidental death
Central Coal & Coke Co	Green, William	Miner	45	1	1	1	Fall of rock	
Totals.				4	4	4		

ACCIDENTS BY COUNTIES—Continued.

Name of employer.	Name of employe.	Occupation.	Am't of insurance. Was the injured Yes party insured? No	Nature of accident.	Coroner's Inquest.
			Fatal.....		
			Non-fatal.....		
			No. of children.....		
			Married.....		
			Single.....		
			Age.....		

PUTNAM COUNTY.

Mendota Coal & Mining Co	DeMack, Thos	Laborer	68	1	3	1	Fall or slip, breaking his arm.	
"	Parker, Frank	Miner	16	1	1	1	Fall of rock, breaking hip and left leg	
Totals.....				1	1	3		

RANDOLPH COUNTY.

Caffery-Baker Coal Co	Bagby, Daniel	Miner	44	1	5	1	After-damp explosion	Death accidental.
Beckwith, John	Beau, Wm	"	30	1	1	1	Premature explosion of blast	Unavoidable accident.
Caffery-Baker Coal Co	Denny, Cn	"	35	1	1	1	Fall of rock	Unavoidable accident.
Caffery-Baker Coal Co	Edwards, Erastus	"	35	1	1	1	After-damp explosion	Unavoidable accident.
Caffery-Baker Coal Co	Hopkins, E	"	45	1	1	1	"	
Caffery-Baker Coal Co	Jones, Silas	"	45	1	1	1	"	
Caffery-Baker Coal Co	Reagan, Migs	"	35	1	1	1	"	
Caffery-Baker Coal Co	Vigbery, Gus	"	30	1	1	1	"	
B. Williams	Walker, Charley	"	42	1	1	1	Fall of rock, leg broken	
Totals.....				7	2	6		

RAY COUNTY.

Richmond & Ounden C. Co	George, Dan'l	Miner	25	1	1	1	Fell down shaft	Accidental.
Kansas & Texas Coal Co	Meyers, Robt.	"	33	1	1	1	Caught by cage; right arm broken	
Totals.....				1	1	1		

LIST OF PROPRIETORS AND OPERATORS.

ADAIR COUNTY.

Proprietor.	Operator.	Postoffice address.
Besanko's mine.....	Robert Besanko.....	Kirksville.....
Scott, D. C.....	D. C. Scott.....	".....
Stahl mine.....	H. C. McCahan.....	".....

AUDRAIN COUNTY..

Davis, C. C.....	C. C. Davis.....	Mexico.....
Detienne, O. J.....	O. J. Detienne.....	Mound Carmel....
Eastham, C. P.....	C. P. Eastham.....	Laddonia.....
Farber Coal Co.....	Farber Coal Co.....	Farber.....
Harrison mine.....	A. M. Harrison.....	Mexico.....
Laddonia Coal Co.	C. N. Turpin.....	Laddonia.....
McGuire mine.....	Samuel McGuire.....	Martinsburg.....
Taylor, W. F. & Co.....	W. F. Taylor & Co.....	".....
Silvers mine.....	L. Silvers.....	Centralia.....
Vandalia Coal Co.....	Vandalia Coal Co.....	Vandalia.....
Vandalia Fire-brick Co.....	".....	".....
Weber mine.....	E. D. & J. W. Weber.....	Laddonia.....

BARTON COUNTY.

Betz mine.....	Jacob Betz.....	Liberal.....
Boulware Bros. mine.....	Lavery & Bros.....	".....
Cameron mine.....	M. W. Wilhelm.....	".....
Clark, W.....	Henry Beeker.....	Lamar.....
Hanshaw's mine.....	W. H. Hanshaw.....	Liberal.....
Elvick mine.....	Dan'l Kimball.....	Lamar.....
Lanyon, S. H.....	Minered Bros.....	Minden mines....
Liberal Coal Co.	Liberal Coal Co.....	Liberal.....
Ryan, G. G.....	T. Cook.....	Montevallo.....
Spear mine.....	M. M. Spear.....	Lamar.....
The Wear Coal Co.....	The Wear Coal Co.....	Pittsburg, Kansas.
Whitsell mine.....	H. J. Whitsell.....	Liberal.....

BOONE COUNTY.

Blackfoot Coal Co.....	J. H. Kern.....	Columbia.....
Columbia Coal Co.....	Hubbard, E. L.....	".....
Davis mine.....	Isaac R. Davis.....	Brown's Station...
Gordon mine.....	S. D. Gordon.....	Columbia.....
Gossett mine.....	John F. Gossett.....	Switzler Station...
Johnson, F. M.....	L. M. Rouse.....	Columbia.....
Rees, Thos.....	James Rees.....	Switzler Station...
Rogers, Henry.....	George Rogers.....	Brown's Station...
Sims mine.....	M. J. Sims.....	Perche.....
Stidham, W. A.....	W. A. Stidham.....	Harrisburg.....
Stine, J. W.....	J. W. Stone.....	Perche.....
Smith & Carter mines.....	Smith & Carter.....	Columbia.....

TABLE X—RECAPITULATION OF COAL MINE ACCIDENTS.

Number of non-fatal accidents.....	27
Number of fatal accidents.....	19
Total number of accidents.....	46
Number of single men injured fatally.....	9
Number of married men injured fatally.....	10
Total fatally injured.....	19
Number of wives made widows.....	13
Number of children made fatherless.....	24
<i>How injured men were employed.</i>	
Miners.....	36
Pit-bosses.....	2
Drivers.....	2
Laborers.....	2
Operator of mine.....	1
Roadman.....	1
Pusher.....	1
Trapper.....	1
Total.....	46

<i>Cause of accidents and number injured from each cause.</i>	<i>Fatal</i>	<i>Non-fatal.</i>	<i>Total.</i>
From falls of roof and coal.....	11	12	23
explosions.....	5	6	11
premature blasts.....	.....	3	3
cages.....	1	2	3
mine cars.....	.....	2	2
falling down shaft.....	2	.....	2
gas.....	.....	1	1
falling while passing through the mine.....	.....	1	1
Totals.....	19	27	46
<i>Accidents by counties.</i>			
Audrain.....	1	1	2
Barton.....	1	.....	1
Bates.....	2	3	5
Henry.....	.....	5	5
Jackson.....	4	2	6
Johnson.....	1	.....	1
Macon.....	3	6	9
Randolph.....	3	6	9
Ray.....	1	1	2
Putnam.....	.....	2	2
Vernon.....	3	1	4
Totals.....	19	27	46

BATES COUNTY.

Proprietor.	Operator.	Postoffice address.
Abston mine	C. G. Deming	Worland
Allen & Williams	H. P. Robinson	Rich Hill
Black Diamond	C. W. Field	Amoret
Bruce & Mandville	Bruce & Mandville	Rich Hill
Chambers mine	Thos. Harris	Worland
Clicks (B. F.) mine	T. Click	"
Davis, E. G.	T. Ehart	Foster
Eynon & Stephens	Albt. Eynon	Worland
Flansburg & Son	J. A. Flansburg & Son	Amsterdam
Ford mine	J. A. Ford	Rockville
Haverfield & Arbogast	David Arbogast	Foster
Hopkins mine	S. W. Hopkins	Rich Hill
Horton mine	Deering & Johnson	Hume
Hudson & Co.	Hudson & Co.	Worland
Irish, Thos	R. E. Allen	Rich Hill
Jones, Chas	Chas. Jones	Worland
Johnson mine	J. Johnson	"
Kincaid, Jos	Pryor & Bruder	"
Lewis mine	John Gerodo	"
Linsey mine	John Linsey	Foster
Manchester mine	Thos. Manchester & Son	Hume
March, John J.	John J. March	Shobe
Martin & Gee Coal Co	Martin & Gee Coal Co	Rich Hill
Morgan mine	J. C. Morgan	Foster
Pearson, Peter	Peter Pearson	Rich Hill
Peeler mine	D. D. Peeler	Rockville
Raney & Washburn	F. A. Raney & Co.	Worland
Rankin Bros.	J. C. Rankin	"
Rich Hill Coal Co	Rich Hill Coal Co.	Rich Hill
Russell mine	M. D. Russell	Foster
Skillman mine	Andrew Skillman	"
Sullivan mine	Wm. Sullivan	Rich Hill
Thomas, J. P.	H. R. Hensley	Foster
Thurman, E. H.	E. H. Thurman	Hume
Walnut Land Co.	Wm. Hoff	Foster
Western Coal & M. Co	F. M. Bear	Worland
Wilson mine	Thos. Wilson	Foster
Wise Coal Co.	J. M. Wise	Rich Hill

CALLAWAY COUNTY.

Bishop mine	Bishop & Cumberland	Fulton
Carbon Valley mine	Flowers & Simmons	"
Castle mine	Wm. Castle	"
Criswell, Warner	R. M. Henderson	Guthrie
Curd mine	Edward Curd	Fulton
Curd, Edward	F. Lamperous	"
Fulton Fire-brick and M. Co	Fulton Fire-brick & M. Co.	"
Harris mine	John Harris	"
Henderson, J. S.	Wm. Allen & Sons	Auxvasse
Marsenkoff, John	John Marsenkoff	Fulton
Smith mine	James Smith	"
Weeks, Wm.	John A. Little	Ham's Prairie

CARROLL COUNTY.

Farr, Ralph	Ralph Farr	Little Compton...
Wallace, Preston	Geo. Williams	Carrollton

CALDWELL COUNTY.

Proprietor.	Operator.	Postoffice address.
Caldwell Coal Co	Caldwell Coal Co	Hamilton
Cowgill Coal Co	Cowgill Coal Co	Cowgill
Kingston Coal Co.....	Kingston Coal Co.....	Kingston
Tom Creek mines.....	Hamilton Coal Co.....	Hamilton

CEDAR COUNTY.

Davis mine.....	A. B. Davis.....	Jerico Springs.....
Duncan mine.....	J. C. Duncan.....	"
Poage mine.....	G. M. Poage	"

CHARITON COUNTY.

Huenten, John	R. Brewer.....	Guthridge Mills....
Isle, R. W	R. W. Isle.....	Indian Grove.....

CLAY COUNTY.

North Kansas City C. and C. Co..	N. K. C. Clay and Coal Co.	Kansas City
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COLE COUNTY.

Leach & Co.	Geo. H. Leach & Co.....	Elston
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COOPER COUNTY.

Hazell Springs Coal Co	Chas. W. Hazell.....	Boonville.....
Jenkins mine.	H. W. Jenkins	"
Mo. Valley Coal and Mfg. Co	Mo. Valley C. and Mfg. Co.	"
Stanley Coal Co.....	Stanley Coal Co	Sedalia

DADE COUNTY.

Clayton, W. R.....	R. M. Sharp	Sylvania.....
McCluey, Robt	Robt. McCluey.....	"
McCombs mine.....	O. P. Ramsey.....	"
McGarvey's mine.....	Thomas Allen.....	"
Seaton, J. R	W. E. Sutton.....	"

GRUNDY COUNTY.

Grundy County Coal Co.....	Grundy County Coal Co....	Trenton
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HENRY COUNTY.

Proprietor.	Operator.	Postoffice address.
Avery, A. C.	Stockton Bros.	Clinton
Ballanger, Saml.	R. W. Huey.	Brownington
Beedy, J. C.	W. E. Hughes.	Windsor
Blair Diamond mine	R. L. Thompson.	Brownington
Blanchard mine	D. C. Blanchard & Sons.	"
Brown & Co.	Edward Brown.	Deepwater
Central Coal and Coke Co.	Central Coal and Coke Co.	Kansas City, Mo.
Colorado mine	Hurst, McFadden & Newbill.	Deepwater
Co-operative Coal Co.	Co-operative Coal Co.	Lewis Station
England mine	Wm. England.	Clinton
Geahart, Theodore	Theodore Geahart.	"
Gibbs, Henry.	Henry Gibbs.	Montrose.
Gedney mine	R. D. Swain, admstr.	Kansas City, Mo.
Hines, F. B.	J. W. Shook.	Windsor
Hurst, J. W.	J. W. Hurst.	Deepwater
Hurst, John.	John Hurst.	"
Hurst, Wm.	Wm. Hurst.	"
McCardell mine.	John McCardell.	"
McLeod, Alex.	Alex McLeod.	Clinton
McFadden Coal Co.	McFadden Coal Co.	Deepwater
Mann, Jas. D.	John W. Martin.	Montrose
Miller, W. J.	L. W. Beaman.	Windsor
North Clinton Coal Co.	North Clinton Coal Co.	Clinton
Owen mine.	B. L. Owen.	Chariton
Parks mine.	B. Carpenter.	Calhoun
Pigg "	D. B. Pigg.	Lewis station.
Reese "	Wm. Reese.	Deepwater.
Rusk "	Wm. Rusk.	"
Schlicker, M. W.	John Adell.	Hartwell.
Stephens mine.	Henry Stephens.	Deepwater.
Stewart "	W. H. Stewart.	Lucas
Terrill, R.	Michaels & Sheridan.	Brownington
Tyler mine.	Not in operation.	Clinton.
Victor mine.	Kellar, Hart & McKeel.	Montrose

JACKSON COUNTY.

Brush Creek mine.	Kansas City.	Kansas City.
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JOHNSON COUNTY.

Boyd, T. H.	P. D. Fitch.	Montserrat
Herrington & Co.	L. M. Herrington.	Warrensburg.
Meily mine.	M. B. Meily.	"
Murley "	Joseph Murley.	Montserrat.
Knob Noster mine	Thos. Boyd & Sons.	Knob Noster
Murray mine.	Madison Murray.	Warrensburg
Ronemous mine.	W. L. Ronemous.	"
Sack, G. H.	John Harding.	Montserrat.
Staurer, J. D.	M. R. & C. L. Staley.	Warrensburg
Tanners mine.	Henry Tanners.	"
Wood mine.	Benj. F. Wood.	"

LAFAYETTE COUNTY.

Proprietor.	Operator.	Postoffice address.
Armstrong, Joseph.....	Harry St. Clair.....	Greenton
Bell & Greer	W. H. Greer	Lexington.....
Bonanza Coal Co	J. B. Brandan	Higginsville
Brackman, H. W.	Dohrman & Lofrenz.....	Concordia
Bruce & Knoble.....	L. P. Knoble.....	Higginsville
Carter mine	Andrew Carter & Son.....	Wellington.....
Cohnant, Frank.....	Frank Cohnant	Higginsville
Corder Coal and Coke Co.....	Corder Coal and Coke Co..	Corder.....
DeBolt mine	J. H. DeBolt	"
Dover Coal Co.....	Dover Coal Co.....	Lexington
Daisy Hill Coal Co.....	W. H. Bell	Corder.....
Duncan mine.....	Chas. E. Duncan	Higginsville.....
Excelsior Coal and Coke Co.....	Excelsior Coal and Coke Co	"
Farmers' Coal Co	John O'Malley	"
"	Beatty, Jones & Campbell.	"
Fox, N. F.	N. F. Fox.....	Dover
Haygood Coal Co.....	Grimes Bros.....	Higginsville
Hawkins & Smith.....	J. E. Wilkes.....	"
Hefner, F.	A. C. Lee.....	"
Holwell mine	Michael Holwell.....	Lexington
Hoppy mine	John White Lewis.....	Corder.....
Keist, Joseph.....	Patrick McDonnell	Lexington
Kresse, A. F.	A. F. Kresse	Concordia
Kreutz, Fred.....	Fred. Kreutz, Jr.....	Wellington.....
Lafayette Coal Co.....	Lafayette Coal Co.....	Lexington
Lexington Coal Co.....	Lexington Coal Co	St. Louis
McGrew mine.....	J. C. McGrew	Lexington
Macey, Henry.....	Henry Macey	Kansas City
Mienerhagen, Fritz	Frank Koesler	Higginsville
Morgan mine	W. P. Morgan	Corder.....
Morrison Bros	Morrison Bros	Lexington
O'Malley, Andrew.....	Andrew O'Malley.....	"
Parady, Alex	Alex. Parady	Higginsville
Radd mine.....	Wm. Radd	Lexington
Riely & Keist.....	Riely & Keist	"
Salt Fork Coal and Mining Co.....	Salt Fork Coal and M. Co..	Corder.....
Seawell & Co.....	J. M. Seawell & Co	Kansas City.....
Stealey & Fowler Coal Co.....	Stealey & Fowler Coal Co..	Higginsville
Strausburg mine.....	The Mathews Coal Co	Mayview
Steinman mine	Henry Bartels	Concordia
Summers mine	M. W. Summers	Alma
Taggart, J. A.	Thos. Walworth.....	Higginsville
The Missouri Coal Mining Co	Brown & Bowers.....	Kansas City, Kas..
The Southwestern Coal Co	The Southwestern Coal Co.	" Mo...
Valentine, John	John Valentine.....	Wellington
Walnut Grove mine	J. P. Hendrick	Concordia
Walton, Thomas.....	Thomas Walton	Lexington
Waverly Coal and Mining Co.....	Waverly Coal and Min. Co.	Waverly
Wellington Coal Co.....	Wellington Coal Co	Wellington
Y. S. A. Coal Co.....	Y. S. A. Coal Co.....	Higginsville

LINN COUNTY.

Bottomly mine	J. C. Bottomly.....	Brookfield
Brookfield Coal and Mining Co	Brookfield Coal and M. C..	"
Clark mine	Geo. Clark	"
Landreith mine.....	R. H. Landreith & Son....	Marceline.....
Marceline Coal Co	Marceline Coal Co	"
Schaeffer mine	Bernard Schaeffer	Brookfield

HENRY COUNTY.

Proprietor.	Operator.	Postoffice address.
Avery, A. C	Chillicothe.....
Ballanger, Saml
Beedy, J. C
Blair Diamond mine
Blanchard mine
Brown & Co
Central Coal and Coke Co
Colorado mine
Co-operative Coal Co
England mine
Geahart, Theodore
Gibbs, Henry
Gedney mine
Hines, F. B
Hurst, J. W
Hurst, John
Hurst, Wm
McCardell mine
McLeod, Alex
McFadden Coal
Mann, Jas.
Miller, W. J
North Clinton
Owen mine
Parks mine
Pigg
Reese
Rusk
Schlicker
Stephens
Stewart
Terri
Tyb
Vie

MONTGOMERY COUNTY.

Vandalia Coal Co.....	Wellsville.....
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NODAWAY COUNTY.

Corydon Bird.....	Quitman.....
John Manargan & Co.....	".....
C. Pierson	".....
J. H. Howard.....	Burlington Junc..
John Wagstaff.....	Quitman.....

PETTIS COUNTY.

Thos. Seran.....	Dunkburg.....
A. Carson.....	Hughesville.....

PUTNAM COUNTY.

Proprietor.	Operator.	Postoffice address.
ins, Wm.....	Patrick Biggy.....	Blackbird
nhart, A. J.....	A. J. Barnhardt.....	Mapleton
Blackbird Coal Co.....	Blackbird Coal Co.....	Blackbird.....
der mine.....	J. H. Carder.....	Unionville.....
kle, R. F.....	Patterson & Boyd.....	"
dota Coal Co.....	Mendota Coal Co.....	Mendota.....
rigo mine.....	Martin Pherigo.....	Elko.....
lers, Virginia.....	Posey Veach.....	Graysville.....

BALLS COUNTY.

er & Yancey ..	Standard Coal Co.....	Perry.....
ard Coal Co.....	Standard Coal Co.....	"

RANDOLPH COUNTY.

wn & Welsby	G. Welsby.....	Renick
d & Roebuck	M. Skinner	Moberly
kinridge mines.....	John Breckinridge.....	Huntsville.....
ery-Baker Coal Co.....	Caffery-Baker Coal Co.....	"
n, Harry.....	Harry Dean.....	Jacksonville.....
lene mine.....	A. D. Ditene	Huntsville.....
rards mine.....	Emanuel Edwards.....	"
ning mine.....	Thomas Fleming.....	Elliott
drick mine.....	James Headrick	Moberly.....
bee Coal Mining Co.....	Higbee Coal and Mining Co	Higbee
rstate Mining Co.....	Wm. Walton	"
Kierman mine.....	W. H. McKierman.....	Moberly.....
his mine.....	E. Phillips.....	Ardmore.....
burn mine.....	Jas. Milburn & Sons.....	Thomas Hill.....
shell mines.....	W. E. Mitchell & Co.....	Huntsville.....
berly Mutual Coal Co.....	Hulcher & Young.....	Moberly
ris mine.....	John L. Morris.....	Renick
s mine.....	Lamb & Bailey	Huntsville.....
ner, John.....	Wm. Miller	Moberly.....
vart mine.....	J. N. Stewart.....	Huntsville.....
eff mine.....	M. Strieff	"
Eagle mine.....	The Eagle Coal Co.....	Moberly
ghn mine.....	Wm. Vaughn	Huntsville.....
d mine.....	Harry Ward	Moberly.....
st, A. G.....	Wm. Brennon.....	"
iams mine.....	J. B. Williams.....	"

LIVINGSTON COUNTY

Proprietor.	Opera	See address.
Cox, W. A	W. A. Cox	.....

MACON Co

[illegible]

CLAIR COUNTY.

Terrill mine.....	R. W. Allison.....	Taborville.....
Terrill, R. H.....	Bachelor Bros.....	Appleton City.....
Watson Coal & Mining Co.....	Wm. E. Bell.....	Osceola.....
	Wm. Dowers.....	Lowry City.....
	Bouthat & Vannice.....	Vista.....
	Michael Gore.....	Johnson City.....
	W. A. Seymour.....	Osceola.....
	Walker Bros.....	Lowry City.....
	Wm. Watkins.....	Osceola.....
Wellsville mine....	N. D. Gibson.....	".....

SALINE COUNTY.

Bird's mine...	John Kiper...	Slater.....
Manargan mine...	Henry Bowman	Sweet Springs.....
Pierson mine..		
Potts, Wm..		
Wagstaff, J		

SCHUYLER COUNTY.

..... T. J. Mock.....	Zola.....
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SULLIVAN COUNTY.

... Preston & Prinderville..... Milan.....

VERNON COUNTY.

	Operator.	Postoffice address.
	Green.....	Bellamy.....
	Coal & Mining Co..	Arthur.....
	Coal & Mining Co	Rich Hill.....
	ake.....	Walker.....
	Lucas.....	Bronaugh.....
	tral Coal & Coke Co....	Kansas City.....
	V. H. Cooper.....	Moundville.....
	C. B. Crawford.....	Walker.....
	S. E. Ferry.....	Milo.....
	Franklin & Scott.....	Kansas City.....
	W. E. Larkin.....	Bronaugh.....
	W. G. Gunterman.....	Sheldon.....
	J. T. Medlin.....	Walker.....
	S. S. Ling.....	Schell City.....
	R. F. Nelson.....	Walker.....
mine.....	F. B. Augur.....	Moundville.....
	W. H. Prewitt.....	Walker.....
& M. Co.....	Rich Hill Coal & M. Co....	Rich Hill.....
	W. D. James.....	Moundville.....
Co.....	Vernon Coal Co.....	Rich Hill.....

RAY COUNTY.

Proprietor.	Operator.
Blissell Coal Co.....	John Blissell
Bovard-Brown Coal Co.....	Lockwood
Darneal Coal Co.....	Darneal
Evans, L. D.....	Joseph
Hartwell, Arnold & Co.....	J. W.
Hayson & Douglas Coal Co.....	Hayson
Huston mine.....	Joseph
Kansas & Texas Coal Co.....	Kans
Mosby & Daugherty.....	Roos
Murray, Jesse.....	Th
New Black Diamond Coal Co.....	P
Old Black Diamond Coal Co.....	D
Pickering Coal Co.....	
Randall mine.....	
Rankin mine.....	
Richmond and Camden Coal Co.....	
Sater mine.....	
Starr, Alex.....	
Williams Coal Co.....	
Wilson, Mrs. Wm.....	

Allison, R. W.....	from a
Batchelor Bros.....	
Bell mine.....	own out
Browning, W. G....	own the
Douthat & Vannice..	
Grantly, H.....	the cage to
Hoover mine.....	anything
Kloss, C.....	
Johnson Land Co....	seam of the
Louis Coal mine ..	coal rock or

Briggs, Isaac.....	ch or canvas,
Marmaduke.....	roof material,
	doors and brat-

	by which the
	horizontally
	the cage guides,
	shaft timbers.
Mock.....	direct for driving
	the mine cars
	in mine.
	used for the con-
	in a mine.
	used on the top of a

	blindri-
	ring

GLOSSARY.

- Catches or keeps**—Catches or rests, of the cage when it is brought to rest at the top, bottom or any intermediate landing; also, stops fitted on a cage to prevent cars from running off.
- Cave-in**—A caving in of the surface over mine workings.
- CH₄**—The chemical symbol for fire-damp.
- Charge**—The amount of powder or other explosive used in one blast, or shot.
- Choke-damp**—(See black damp).
- Chute** (also spelled **Shute**)—Any passage through which the coal descends by gravity.
- Clanney lamp**—A safety-lamp invented by Dr. Clanney.
- Clod**—A layer of soft shale or slate, forming a very bad roof over a seam of coal.
- Coal measures**—The carboniferous formation.
- Colliery**—The whole plant, including the mine and all adjuncts.
- Column pipe**—The pipe through which the water is conveyed from the mine pumps to the surface.
- Creep, or squeeze**—The gradual upheaval of the floor of a mine, due to the weight of the overlying strata.
- Crib**—A structure composed of horizontal frames of timber laid upon one another, or a frame-work built like a log cabin.
- Cribbing**—Timbering a shaft with crib-work, commonly extending from surface to the bottom.
- Cropping out**—Coming to the surface; out-cropping.
- Cross-cut**—A small passage-way driven at right angles to the main heading or entry to connect it with a parallel gangway or air-course.
- Davy lamp**—A safety-lamp invented by Sir Humphrey Davy.
- Dead-work**—Work which at the time it is done and of itself produces little or no profit.
- Digging**—Mining operations in coal or other mines.
- Dip**—To slope downward from the surface; the inclination of a stratum of a coal seam.
- Ditch**—The drainage gutter.
- Doors**—Wooden doors fixed in underground roads to prevent the ventilating current from taking a short cut to the upcast air-way.

- Downcast**—The opening through which the fresh air is drawn or forced into the mine—the in-take.
- Drift**—A water-level gangway or entry driven into the seam from the surface.
- Drum**—The revolving cylinder around which the winding rope is coiled.
- Dump**—(1) A pile or heap of ore, coal, slate or rock. (2) The tippie by which the cars are dumped. (3) To unload a car by tipping it up.
- Entry**—Main hauling roads or gangways.
- Face, or working face**—The place at which the coal is actually being worked away, either in a breast or heading.
- Fall**—(1) A mass of roof or side which has fallen in any part of a mine. (2) To blast or wedge down coal.
- Fan**—Centrifugal mechanical ventilator.
- Fault**—A fracture or disturbance of the stratum breaking the continuity of the seam.
- Fire**—A word shouted by miners to warn one another when a shot is fired.
- Fire-boas**—A man whose duty it is to examine the workings for accumulation of explosive gas, etc.
- Fire-damp**—The explosive gas of coal mines—light carburetted hydrogen; the chemical formula $C H_4$.
- Furnace**—A large coal fire at or near the bottom of an upcast shaft, for producing a current of air for ventilating the mine.
- Gas**—Fire-damp.
- Goaf or gob**—(1) A space from which the coal has been worked away and the space more or less filled up. (2) The refuse or waste left in the mine.
- Gob-fire**—Spontaneous combustion underground.
- Guides**—Vertical timbers fastened to the buntons to steady and guide the cage.
- Head-gear**—The pulley frame erected over a shaft.
- Head-house**—When head-frame is housed in, the structure is known by this name.
- Heading**—A gangway or entry.
- Horseback**—Natural channels cut or washed away by water, in a coal seam, and filled up with shale and sandstone. Sometimes a bank or ridge of foreign matter in a coal seam.
- Incline**—A slope, any inclined plane, whether above or below the surface.
- Indicator**—Any instrument or device for indicating the position of the cage in the shaft.
- In-take**—The passage through which the fresh air is drawn or forced in a mine.
- Keeps**—See Catches.
- Lagging**—Small round timber, slabs or planks, driven in behind the legs and over the collar to prevent pieces of the roof from falling through.
- Landing**—The top or bottom of a slope, shaft or inclined plane.
- Latches**—A synonym of switch, applied to the split-rail and hinged switches.
- Long-wall**—A system of working a seam of coal in which the whole of the seam is taken out, leaving no pillars, except sometimes a pillar to support the bottom of shaft.
- Loader**—One who fills the mine cars at the working place.
- Manager**—An official who has the daily control and supervision of a mine, both above and below ground.
- Manway**—A small passage used as a traveling way for the miner.
- Motive column**—The length of column of air in the downcast shaft which would be equal in weight to the difference in weight of the air in downcast and upcast shaft. The power obtained by furnace ventilation is measured by the difference of the weight of the air in the two shafts.
- Mouth**—The surface end of a shaft or drift.
- Narrow work**—Headings, air-courses, gangways, entries, etc.
- Natural ventilation**—Ventilating a mine without furnace or other artificial means.
- Needle**—A sharp-pointed metal rod, placed in a bore-hole during the tamping of the charge, to leave on its withdrawal an opening through which the charge can be fired.
- Nut coal**—Coal that passes through an inch or an inch and one-half screen, and over a half-inch screen.
- Out-crop**—That portion of a vein, bed or any stratum appearing at the surface or occurring immediately beneath the soil.
- Output**—The total product of a mine.
- Overcast**—A passage through which the ventilating current is conveyed over an entry or air-course.
- Parting**—Any thin or inter-stratified bed of earthy material.
- Pillar**—A solid block of coal left to support the roof.
- Pillar and room**—A system of working coal by which solid blocks of coal are left on either side of rooms, entries, etc., to support the roof until the rooms are driven up, after which they are drawn out.
- Pitch**—Dip or rise of a seam.
- Plan**—The system on which mine is worked, as "long-wall," pillar and room," etc.
- Propping**—The timbering of a mine.
- Prospecting**—Examining a tract of country in search of minerals.
- Pulley**—The wheel over which a winding rope passes at the top of the head-gear.
- Regulator**—A frame with a slide door to regulate the amount of air passing into any part of the workings.
- Return air**—Air that has passed through the workings.
- Rib**—The side of a pillar.
- Roof**—The rock lying above a coal bed or ore vein.

GLOSSARY

OF MINING TERMS USED IN :

After-damp—The mixture of gases remaining in a mine after an explosion of fire-damp.

Air—The current of atmospheric air circulating through and ventilating the workings of a mine.

Air-shaft—A shaft used expressly for ventilation.

Air-stack—A ventilating chimney.

Air-way—Any passage in a mine through which air for ventilating purposes is passed.

Anemometer—An instrument used for measuring the velocity of a ventilating current.

Bearing in—Undermining.

Black damp—Carbonic acid gas= CO_2 . It will not support combustion or life.

Blower—A strong discharge of gas from a fissure.

Blown-out shot—A shot that has blown out the tamping without bringing down the coal.

Bonnet—A shield or covering over a cage to protect it and the miners from anything falling down the shaft.

Bottom—The landing at the bottom of the shaft or slope; the floor, bottom rock or stratum underlying a coal seam.

Brattice—A division or partition in a shaft, slope, heading, gangway or other underground working places for providing ventilation.

Brattice-cloth—A heavy cloth or canvas often covered with water-proof material used in the construction of doors and brattices instead of plank.

Bridle-chains—Short chains by which rope is attached to the cage.

Buntons—Timbers placed horizontally across a shaft to carry the cage and also to strengthen the shaft timbers.

Butty—A partner in a contract for work or mining; comrade, crony.

Cage—A platform on which the miners are raised and lowered in mine.

Car—mine-car—Any car used for conveyance of coal or mineral in a mine.

Cap—A piece of plank used on the top of a prop.

Cartridge—Paper or water-proof cases filled with gun-powder, the charge for blasting.

Catches—
to hold
at the
landing
vent
Cave-in
mine
CH₄
Char
ple
Chol
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REPORT ON
LEAD, ZINC AND IRON

FOR YEAR ENDING JUNE 30, 1894.

FRANCIS A. LAGRAVE, INSPECTOR.

Safety-cage—A cage provided with an automatic safety-catch.

Safety-lamp—A miner's lamp, in which the flame is protected in such a manner that an explosive mixture of air and fire-damp can be detected by the mixture burning inside of the gauze. This warns the miner to extinguish his light, as the mixture is dangerous.

Screen—(1) A mechanical apparatus for separating small from large coals. (2) A cloth brattice or curtain hung across a road in a mine to direct the ventilation.

Safety catches—Appliances fitted to cages to make them *safety-cages*.

Seam—(1.) A bed of coal. (2.) A fissure or joint, either empty or filled with foreign matter.

Shaft—A vertical hole or pit made through strata, through which the product of the mine is brought to the surface, and through which the ventilation is passed either into or out of the mine.

Sheave—A wheel with a grooved circumference, over which a rope is turned, either for the transmission of power or for winding or hauling.

Shot—(1) A blast. (2) The firing of a blast. (3) Injured by a blast.

Shot-lighter or Shot-firer—A man specially appointed by the manager of the mine to fire off shots.

Sink—To excavate, to bore or put down a bore-hole.

Siphon—A simple, very effective and economical mode of conveying water in a mine over a hill. It takes the form of an iron pipe, bent like an inverted U; the vertical height between the water and top of hill must not exceed 28 or 30 feet, and the discharge end must be lower than the suction end.

Slack—Small coal which will pass through a small screen.

Slip—(1) A fault. (2) A smooth joint or crack in seam.

Slope—The main engine plane or inclined roadway driven in the seam of coal worked from the out-crop, up which the whole of the product of the mine is raised by the winding engine.

Sprag—(1) A lock the wheel brake. (2) slanting post while it is in

Squeeze—St

Steam coal
ing coal.

Steam-jet

by means of
high pressure
from a
the upper

Stopping
any part

Strip—A
bed of
work.

Sump
age
pump

Sulphur
Tamp

chamber
station

Timber
etc.

Tram

Tram
road

Tram
road

Tram

U

V

V

V

TRANSMITTAL.

Director of Labor, Jefferson City, Mo.:

Director of Missouri of all mines other than coal,
The Eighth Annual Report of this office for

Statistical information regarding the equipment,
mines, and other tables which have been shown
all of which are extended to include the returns
table of accidents, which speaks well for the
when comparatively few casualties this year. The
leading metals of the State will be found to have
Under the caption of "Lead and Zinc" I have
ent reasons therefor, and under the same caption I
the present mining laws of the State, thinking them,
of the conditions of mining.

Heretofore noticed in these reports, I have this year
some tabulated statements relative to the fire-clay and
of the State; a statement, by years, of the production of
since 1873; and a statement, by years, of the price of pig
three being obtained through the kindness of Mr. J. R.
The table showing the price of zinc, by years, included in
also extended up to date, and continued.

Reached upon is our tripoli product, in regard to which I have
published lately in the "Scientific American," as giving
of it.

With the report is an article on "The Present Condition of the
Missouri" from the pen of Mr. J. R. Holibaugh, M. E. of Joplin,
highly interesting to all persons in any way concerned in that
here to thank Mr. Holibaugh very much for his kindness in fur-
ing, and for the deep interest taken by him in the compilation of

Respectfully,

FRANCIS A. LaGRAVE.

REPORT.

This, the Eighth Annual Report, ending June 30, 1894, shows the relative production of the leading ores of the State to have changed considerably during this year. There has been a falling off in the production of zinc ore, but a very material increase in that of lead, while iron, after making an attempt at production, has ceased altogether.

LEAD AND ZINC.

With reference to the above, regarding the difference in the production of these two metals, the fact that some of the old mines in the southeastern part of the State increased their production a great deal this year, and several new properties having been opened up in that section, together form the principal cause of the increased lead tonnage. Then, too, the mines in the southwest, wherever possible, worked their lead deposits in preference to zinc, they having found that more profitable under the recent changed prices. This accounts so, in part, for the decrease in zinc tonnage. The tables of this report show the decrease of tonnage production of zinc to be 17.5%, and the increase of lead 22.5%.

The general business depression experienced all over this country during the period for which this report is made, has had its effect on the mines of this State, as is shown by the very low prices obtained for ores this year. The average price of zinc ore is \$5.57 per ton less than last year, while the price of lead has dropped \$1.86 per ton. In spite of this the mines are in a prosperous condition, and while not worked to their full capacity, are steadily pushing developments, expecting that the near future will bring greater demand and better prices.

The Southwest is still producing heavily, with every prospect of continuing to do so. The deposits of both lead and zinc in that section are seemingly inexhaustible. During the year, many new shafts were sunk and new concentrating plants built and others contemplated for the future, all indicating an increased production in that section.

In Southeast Missouri, and in St. Francois county in particular, a large quantity of territory has been proven by the diamond drill, and enormous deposits of lead ore found, all of a disseminated character, this work being done preparatory to the development of mines. On these deposits, several new companies have opened up this year (having been operated but a short time, their output for the fiscal year appears small,) and all the old companies have sunk new shafts, which will be worked the coming year.

From the outlook in these two sections, and judging from the number of new mines opened, and the amount of development made this year, we may confidently expect Missouri in the next year to be the banner lead-producing state in the Union.

The mining laws of this State, as they stand at present, are generally understood as being, and no doubt were intended (at least, the greater portion of them) to be, applicable to coal mines only, and the operators of lead and zinc mines, consequently, labor under hardships in complying with all their requirements. Many provisions of our present laws can only be complied with at great expense to the operators, and in a great many cases, especially in the southwest, it is utterly impossible to apply the laws to their fullest extent. The only remedy for this is action by the Legislature. Our mining laws could, and should, be so modified or amended that no hardships would be imposed upon any one class of mines, and they could, surely, be made more conformatory to the different conditions found in the two classes of mines—that is, coal and other mines.

A short notice of the leading producers of lead and zinc in the State is herewith offered. Detailed information regarding number and depth of shafts, men employed, etc., of all mines, will be found in the tables.

LEAD AND ZINC MINES.

Comparison of general items and results.	1893	1894
Number of counties producing lead and zinc ores.....	8	10
“ shafts operated..	573	563
“ tons of lead ore mined.....	40,297	52,003
“ tons of zinc ore mined.....	108,591	89,150
Amount received for lead ore product.....	\$1,585,569	\$1,949,568
Amount received for zinc ore product.....	\$2,245,028	\$1,337,910
Total amount received for output of lead and zinc ores..	\$3,830,597	\$3,287,478
Average price per ton received for lead ore.	\$39 34	\$37 48
Average price per ton received for zinc ore.....	\$20 57	\$15 00
Total number of men employed.....	5,113	5,065
“ “ miners employed.....	3,731	3,421
“ “ other employes.....	1,382	1,644
“ “ employes fatally injured.....	17	17
“ “ employes non-fatally injured.....	7	29
“ “ wives made widows.....	8	8
“ “ children made fatherless.....	14	13
Tons of ore mined for each life lost.....	8,758	8,303
Number of men prospecting for ore.	751	912

PRESENT CONDITION OF THE ZINC MINING INDUSTRY OF MISSOURI.

By J. R. HOLIBAUGH, Mining Engineer, Joplin, Missouri.

It may be truly said that a zinc industry is the distinctive product of the State of Missouri. It is confined at the present time to a smaller area than any other of the varied mining industries of the State, and it is of more recent development than any other important branch of economic metallurgy. We find, according to history, that the precious metals, such as gold, silver and the base metals, iron, copper, lead and tin, were extracted from their ores in ancient times. It is also found that the first successful process of the zinc industry was introduced less than 100 years ago in Europe, while the industry in the United States is of a recent date. The zinc mines of Southwest Missouri were first discovered and opened up in the year 1873, by the lead mines. At first, but little attention was given to the deposits of zinc ore, as at that time there was little or no demand for the zinc; however, as the quality and grade of the ore became known, the price and demand increased, so that miners and mine operators commenced prospecting exclusively for zinc ore, and in 20 years the industry has been built up, so that at the present time Missouri contains the largest zinc-mining district in the world, and stands fourth with reference to production compared with the countries of the world.

I take pleasure in giving the following extract of Walter Renton Ingals' able article in the Mineral Industry, Vol. II, published by R. P. Rothwell, of New York:

"It is not known to whom the isolation of zinc is due, but it is mentioned by Paracelsus (1493-1541). In 1721 Henckel published his discovery of the fact that it could be obtained from calamine, and he is named by Beckman as the first who intentionally carried out this process.*

"The art of zinc smelting was practiced in England as early as 1740, the first works (according to Pryce) having been erected at Bristol by John Champion, to whom a patent for the process of distillation downward was granted in 1739. Calamine brass had been made in Surrey a century earlier. In 1742, Van Swab produced the metal at Westerwick, in Dalecarlia, where it was proposed to erect large works. None of these early experiments, however, seem to have been of much importance; certainly none of them led to the establishment of a permanent industry, which did not begin until more than 80 years after Henckel's discovery. The principle upon which the modern process of zinc smelting is based, or rather the method of carrying out the principle in practice, was discovered in Silesia in 1798, or about that time. A similar discovery was made accidentally and independently in Belgium in 1805 by Abbe Dony, who does not appear to have been acquainted with the work of others in the same direction.

"The two processes of zinc smelting—the Silesian and Belgian—in use at the present time have been developed from these beginnings. Some features of the former have been introduced in the latter, and *vice versa*; but there have been no revolutionary improvements in either, as in the metallurgy of copper and lead, and each remains essentially unchanged. Numerous attempts have been made by zinc metallurgists—notably, by Muller, Lencanhez, Clerc, Thum and Kohler—to reduce the cost of producing zinc by distillation in shaft furnaces introduced in the small vessels used heretofore, but none of these experiments have led to the de-

*It is certain that zinc was made in the East at a much earlier date; according to Raynal, the Dutch East India Company purchased annually 1,500,000 pounds of zinc at Falenburg, and there can be no doubt that knowledge of the process was first brought to Europe from India.

sired end, because it is impossible to prevent oxidation of the zinc and the formation of zinc powder in comparatively large amounts, thereby giving products which must be reworked in small retorts and leading to higher metallurgical losses.†

"Zinc was first made in the United States about 1838, at the United States Arsenal, in Washington, from the red zinc ore of New Jersey, for the brass designs for standard weights and measures ordered by Congress. The process proved so expensive, however, that for a long time there was no idea of treating this ore commercially.

"The regular manufacture of zinc was first undertaken in 1850 at the works of the New Jersey Zinc Company, Belgian furnaces being used, and the Silesian process was tried in 1856 by Matthiessen and Hegeler at the works of the Lehigh Zinc Company. Neither the Belgian nor the Silesian process was at first successful in the United States, owing apparently to the difficulty in making retorts and muffles of a composition adapted to the peculiar character of the ore, and their failure led to various experiments with different processes. Samuel Wetherill, of Bethlehem, Pa., attempted to produce spelter by treating the ores in open furnaces, the oxidized fumes being drawn through incandescent anthracite to reduce the zinc oxide to metal. A few tons of zinc were made in this manner, but the process did not prove practicable. Mr. Wetherill subsequently designed a zinc furnace with upright retorts, for which he succeeded in devising a mixture sufficiently refractory to withstand the corrosion of the basic New Jersey ores. This obstacle having been overcome, the Belgian furnace was readopted, and in 1860 works were constructed at Bethlehem, Pa., to carry out the process.

PRICE OF ZINC.

"The price of zinc since the metal first became of industrial importance has been subject to curious fluctuations. Unlike most of the other metals of which the value has gradually decreased with improved methods of smelting, that of zinc is now little below the rate of previous years, and is actually higher than the general market price during the first two decades of the commercial history of the metal.

"This remarkable circumstance is due to the slight demand at first for the new and little known metal, and the fact that the cost of production in Silesia 80 years ago was less than the present. The increase in the wages of labor and the cost of ore and coal since 1814, has more than kept pace with the saving effected by new and improved mining and metallurgical methods.

"Previous to 1814 the price of zinc in Upper Silesia appears to have been over 30 marks for 50 kilos * (\$150 per ton), but upon the rapid development of the industry in that year there was a falling off, so that in 1814 the price was 21 marks per centner (\$105 per ton); in 1815, 20 marks (\$100 per ton), and in 1817 and 1818, only 16 marks (\$80 per ton). In 1820 the price fell further to 10½ marks (\$52.50 per ton), which was lower than the average cost of production at that time. Wherefore arose the first crisis in the zinc industry, many of the newly established works being obliged to close.

† For an account of some recent experiments in this direction, the reader is referred to an article by Prof. Walther Hempel in *Berg- und Huttenmannische Zeitung*, Oct. 13 and 20, 1898.

* Zinc is quoted in Breslau customarily in German (50 kilos), and in recounting the course of Silesia zinc that form will be used, with equivalent price in dollars per metric ton in parentheses. With spelter at £17 15s to £17 17s 6d per ton in London, the Breslau price is about 17.50 marks per 50 kilos.

"Until 1821, the chief market for Silurian zinc was in Asia, whither it was shipped over Russia; in 1821, exportations to British India were begun, and soon grew to such an extent that the Chinese zinc was driven out of that market. This circumstance, together with the restricted production and the erection of the first rolling-mill at Malapane, Friedrichshuette and Rybnik, thus affording a new home market for spelter, sent the price for the metal up to 32 marks (\$160) per ton, at the beginning of 1823; but this led to such a great increase in the make that the demand was quickly outstripped, and a second crisis in the industry resulted, which lasted from 1826 to 1830. At times, it was impossible to sell at all, and only the most favorably situated works could keep in operation, the production of the province falling off more than one-half its former maximum. The lowest point was reached in 1829, when spelter was quoted at 9 marks (\$45 per ton) at Breslau. In 1830, the zinc industry began to develop on a sounder basis. The price for the metal remained low during the next ten years, but sales became more regular, and gradually the demand began again to exceed the production, in consequence of which prices ruled high from 1840 to 1848, varying from 16 to 26 marks (\$80 to \$130).

"The political disturbances of 1848-50 then gave the industry a set-back, which lasted until 1852—prices ranging from 11 to 13.50 marks (\$54 to \$67.50), but from that time until 1878 there was a steady prosperity, which was only interrupted by the financial crisis of 1858 and 1873 and the wars of 1866 and 1870-71. The exhaustion of some of the important deposits of calamine (especially the Scharley and Maïse mines), in 1870, led to a decrease in the productions, and an increase in prices owing to the higher cost of ore; but at the end of the decade all the works were equipped with roasting-plants for the treatment of the blende, which had first begun to be exploited in 1870. The supply of this being large, the value of zinc in the five years following 1878 increased five marks, or 25% below that of the 10 years preceding 1878, and in 1883 was lower than it had been for 30 years.

"The average price of Silesian zinc per centner and per ton at Breslau by decades since 1830 has been as follows:

"1830-40, 13.04 marks (\$65.20); 1840-50, 18.17 marks (\$90.85); 1850-60, 18.14 marks (\$92.10); 1860-70, 18.32 marks (\$91.60); 1870-80, 20.15 marks (\$100.75).*

"The history of spelter since 1880 down to the present time is well-known by the St. Louis and New York market quotations.

ORES OF ZINC.

"Zinc ores are widely distributed through the world, workable deposits occurring in nearly every country in Europe and in various parts of the United States, while there are others in Australia, Mexico, and less well-explored regions which are not yet available on account of their inaccessibility. The principal ores of zinc are the following:

Smithsonite (Zn CO_3), 52%, zinc.

Hydrozincite ($\text{Zn}_2 \text{CO}_3 + \frac{1}{2} \text{H}_2\text{O}$), 57.1% zinc.

Willemite ($\text{Zn}_2 \text{SiO}_4$), 58.1% zinc.

Hydrosilicate ($\text{Zn}_2 \text{SiO}_4$), 53% zinc.

Zincite (Zn O), 80.2% zinc.

Franklinite [$(\text{Fe Zn}) \text{O} + (\text{Fe Mn})_2 \text{O}_3$], 21% zinc.

Blende (Zn S), 66.9% zinc.

*This data concerning the fluctuations in the price of Silesian zinc ore taken from a pamphlet by Herr Bergrath Bernhardi, general director of the Wilhelminehütte, on the fiftieth anniversary of those works.

"The carbonate and silicate are commonly referred to by the general term "calamine," which was formerly the only class of zinc ore used for the production of spelter, but the exhaustion of the easily worked surface deposits brought the undecomposed blende ore into the market, and during the last twenty years its importance has been steadily increasing. At the present time, however, the most part of the zinc produced in Europe is probably still derived from calamine, though in the United States blende is and has been for many years by far the more important of the two ores. Red zinc ore and franklinite, which are used in New Jersey for the manufacture of zinc white, are ores peculiar to that state, and comparatively unimportant as a source of spelter. Certain European zinc works however, employ an artificial oxide of zinc, which is obtained from the upper parts of the blast-furnaces smelting zinc-bearing ores.

VALUE OF ORE.

"The value of a zinc ore at Antwerp or Swansea depends in general upon its grade and character, and the price of spelter in London. There are various formulæ based on the cost of treatment, loss in treatment, whereby the value of an ore, aside from the needs or requirements of an individual smelter at a particular time, may be determined.

"One of these, by Antwerp buyers, is the following :

$$V = \left(\frac{T - \frac{T}{S}}{10} \right) (P - 2.50) - D.$$

V=Value of ore in francs per ton.

T=Percent zinc in ore.

S=Loss in treatment expressed fractionally—commonly calculated $\frac{1}{3}$.

P=Price of spelter in francs per kilos.

D=Cost of treatment—commonly calculated 60f.

"Different values may be substituted for S and D to suit different conditions, and that for P varies naturally with the fluctuations of exchange and the London metal market. According to this formula the value of an ore containing 50% zinc, ex. ship at Antwerp, with spelter quoted at 44.68f per 100 kilos (£18 in London, exchange being taken at 25.20), would be 108.72f per ton.

"The principal ore buyers in Swansea employ the following rule in estimating the value per ton of ore: From 100 deduct the calcination loss, and divide the percentage of zinc in the ore, less 1, by the result. From the quotient deduct one, fifth, plus 1, and multiply the remainder by the London quotations for spelter per ton, less £1, and divide by 100; deduct £1 10s for smelting charges, and then subtract the calcination loss from the remainder, finally subtracting 5s per ton for cost of calcination.

"The value of zinc ores in Antwerp does not differ much from that in Southwest Missouri. For instance, when spelter was quoted in London at £17 10s (\$84) per long ton, or 3.75c per lb., the New York price was 4.30c per lb. Zinc blende ore of average grade (56% zinc) sold in Joplin then for \$21.50 per ton of 2000 lbs., which was equivalent to \$23.70 per metric ton; allowing \$3 per ton as the difference between the value of a sulphide and a calcined carbonate ore of this grade, the value of a 56% ore in Joplin and a 50% ore in Antwerp at the same time was \$26.70 and \$24.00 per ton, respectively, or 47.7c and 48c per unit of zinc contained. This comparison is only indicative of the relative values of ore in the two markets, and is not exact, because in Missouri the price of ore does not fluctuate so closely in accordance with the price of spelter as in Belgium, and at the time selected it

may have been abnormally affected by local causes. To make an exact comparison, it would be necessary to take the quotations for a long period; the preceding will show, however, that the difference in values is not so large."

It was not my intention when starting in with this contribution to the lead and zinc report, to draw so largely from Walter Renton Ingals' able article on the zinc industry of Europe, contained in the *Mineral Industry*, Vol. II; but the information is so exhaustive and contains so much valuable information, that I regret that space will not permit the publishing of his entire review. But as to the present condition of the zinc industry of the State of Missouri, it has taken twenty years to build this great industry up to its present standard, and this standard has practically been reached without the aid of outside capital. The mines have been developed and opened by the persistent labor and untiring energy of poor men, and as a result much of the mining operations have been carried on in the most primitive manner, in the way of mining, hoisting and cleaning the ore. In the older parts of the mining districts new and improved methods have been introduced within the past few years, and the prospectors and miners who work on their own account have been reaching out into new fields and opening up new territory, which proves conclusively that the extent of our zinc ore deposits has not yet been determined. As this district stands at the present time, we rank fourth in the world's production of zinc. Belgium first, Silesia second, and the United States third. A record of the production of the past twenty years shows that the production from this district has been more rapid than that of any other district in the world, and we are producing a better and higher grade of zinc ore than any other district.

There are many things in connection with the operations of our zinc mines that require some special legislation whereby the land owner, mine operator and miner would be materially benefited, and as the production has assumed such enormous proportions, and is gradually increasing, we trust that our coming session of the Legislature will see fit to make some investigations and remedy some of the existing evils by enacting statutory law. The State Mine Inspector of the lead and zinc mines is hampered, to a great extent, in the performance of his duties, as the present laws under which he is guided are only applicable to the coal mines, and cannot be made to apply to our zinc mines.

Again, the work of collecting the statistics for the compilation of the annual report is very unsatisfactory and inconvenient to the operators. These statistics could be collected much more accurately and satisfactorily if they were thrown into calendar years instead of fiscal years, as immediately after the 31st of Dec., the mining companies close up their books for the year, and strike a balance, giving the amount of lead and zinc ore produced, amount of money received, and expense and profit, so that a statement can be made in a few minutes; whereas, as it now is, the mining company is compelled to take six months of each year, and this involves considerable clerical work, which in many instances is neglected from time to time, and finally not made out. I know these facts from experience, and only offer these suggestions so that the distinctive product of Missouri can be compiled into a report, which the mine operators and the State may well feel proud to send out to those seeking valuable information of our zinc mines.

JASPER COUNTY.

CENTER CREEK MINING COMPANY.

The Center Creek Mining Co.'s mines are situated in Webb City. This company has the honor this year of being the largest producer in the zinc fields of Missouri, leading the procession with an output of 10,000 tons of that commodity. These mines have been large producers since their first discovery, and still continue so, but their output could be increased indefinitely if the prices of lead and zinc ores would make it a little more remunerative to the lessees and miners. At present there are 40 ore-producing mines located on this land, which give employment, directly and indirectly, to about 300 men. Valuation of this year's output is over \$185,000.

CHATHAM MINING COMPANY.

This company owns a tract of land situated in both Webb City and Cartersville, being, in fact, divided into two parts by the boundary line of the two cities. The mines on the property are very fine producers, the principal part of the product being zinc blende of very fine quality. All of their product is concentrated and cleaned at the mouths of the different shafts, which were connected with the railroad, and from there shipped to the different smelters. During the past year, the company has given employment to an average of 240 men per week, and shows as its product for that time an output of ore valued at more than \$151,000.

ELEVENTH HOUR MINING COMPANY.

The mines of this company are situated in the southeastern part of Cartersville, and are the largest producers of that town—in fact, nearly the largest in the entire district, being second only to the Center Creek mines of Webb City. Their product this year was over 9300 tons of ore, valued at \$17,000 the greater portion being zinc blende of a very fine quality. Ore is being taken out of about 25 shafts, which average 170 feet in depth, and give employment to about 250 men. All of the product is dressed and made ready for the market right at the mines. The company has a large amount of territory developed, which promises to increase very materially their already large product.

THE EMPIRE ZINC COMPANY.

The mines of this company are situated in the city of Joplin, where they are also operating a large zinc smelter. They reduce not only the ore taken from their own mines, but a quantity mined on other

properties. There are 36 ore-producing mines on this property, and the ore is found at all the way from 30 to 165 feet below the surface. This is one of the big mines of this region, as the value of this year's output (\$130,000) shows. The zinc concentrates from these mines seem to be exceptionally clear and good, as the general manager, Mr. W. C. Wetherill, prides himself on the extra fine work of the mills.

GRANBY MINING AND SMELTING COMPANY.

The mines of this company are situated in and around the town of Granby, Newton county, where the company owns very large quantities of land. These mines have been worked for many years. Prior to the advent of railroads in that country, the product of these mines was hauled by wagon to points on the Missouri river for shipment.

Besides the mines around Granby, the company operates mines in Joplin and Oronogo, Jasper county, which are all doing well. Their output of \$132,000 is divided between Granby, Joplin and Oronogo in the proportion of one-half, one-third and one-sixth respectively, in the order named.

JACOBS BROS. MINES.

This is a 40-acre tract of land owned in fee simple by W. H. Leckie and operated by Jacobs Bros., of Carthage, and C. O. Frye (superintendent) of Joplin, and is situated about one mile east of Joplin. This was formerly known as the old Pinkard mines, and was noted for its production of surface lead. Recent developments have proven the deposits of ore to be very large and continuous. These parties operate another 40-acre tract adjoining this one, which is as good—this latter, however, being shown in the tabled report under the name of Harrison & Spencer. The value of this year's product for the two properties is over \$85,000, which is divided equally between the two.

MARGERUM MINING COMPANY.

The Margerum Mining Company's mine is located in the corporate limits of Oronogo, on the south side, and is properly within what is known as the "Center Creek bottom." Up to late in the year 1891, this particular locality was not looked upon as favorable to mining purposes, but a shallow deposit of lead was found, and the subsequent developments have proven very productive of lead ore. The property has been almost distinctively a lead producer, and carries the banner for the Southwest in the production of that commodity. The water is very strong in the mines, and during the past year three pumps, with a steam plant for operating same, have had to be put in.

MOUND CITY MINING COMPANY.

This is one of Carterville's mines. The property contains 80 acres held under lease from Thos. Connor, and is now well developed with steam-hoisting and concentrating plants. Considerable attention has been given to underground explorations and the opening up of ore deposits, the main shaft having been extended 385 feet in the ore body, and proven it to be 42 feet thick. Under the administration of Mr. Louis Helm, its present manager, the property has become a good producer and seems to have a bright future, if one may judge from the amount of ore in sight in the different openings. This year's output is \$28,000.

E. N. PERRY MINES.

This property is situated in the southeastern part of Carterville, and contains 50 acres, 10 acres of which is owned in fee simple by Mr. E. N. Perry, and 40 acres operated under lease. It is one of the mines located in the famous Carterville basin, which has produced so much in the last few years, and which is still the largest producer of zinc blende in the district. The property is well developed, and is a large and steady producer, mostly, however, being operated by miners under sub-lease. A concentrating plant has been built during the year, and the value of the ore output for the same period is over \$70,000.

RICHLAND MINING COMPANY.

The Richland Mining Co.'s mines, of which Mr. J. M. Waugh is superintendent and manager, are situated in the city of Carterville. Nine shafts are being worked, producing this year \$38,784 worth of ore, almost all lead. This is owing to the fact that the remuneration received from lead ore has been greater than that received from zinc, and the consequent continuous working of the lead prospects.

A concentrating plant has been put up within the year, and the prospects are that for the coming year the company will have a very materially increased production to report.

REX MINING COMPANY.

The Rex Mining Co. have their mines situated some two miles east of Joplin, where they have 1000 acres of fine mining land. They are making a splendid output, this year's valuation of their ores (\$156,000) being the largest in Joplin, and nearly the largest in the entire southwestern district. They are comparatively new mines, and the possibilities of future production great, as energetic men are now pushing development, expecting reward in the increased prices of ores. The

company have large and well-equipped concentrating plants on their premises, and with these and its mines gives employment to about 300 men. The mines are worked on the royalty system, so prevalent in the whole district.

SOUTH JOPLIN LEAD AND ZINC COMPANY.

The tract of land operated by this company contains 40 acres located in the southern part of the city of Joplin. For the first three years its development was confined to a small area, but during 1893 considerable new development was made which opened up new and productive ore bodies, and the property is now a large and steady producer of both lead and zinc. During the year, the company has put up a new concentrating plant, replacing the one burnt down, sunk a new ventilating-shaft, and put down three drill-holes to a depth of 150 feet.

TROUP MINING COMPANY.

The Troup Mining Co.'s property is located in the southeastern corner of Carterville, and has been a very productive piece of land since the first discovery of the ore deposits, which are found at a depth of 150 to 200 feet. Last year's production was not up to the average, owing to the general depression in the mining business, but it may be of interest to know that the value of their output for the last three years has been \$269,000, and if we are to judge from the developments being made, the property will excel all its former efforts in the near future.

VICTOR MINING COMPANY.

The Victor Mining Co.'s mine is one of the several large producers situate in the Carterville basin, in the town of Carterville. The one shaft on the property is down to a depth of 220 feet, and the company gives employment to 35 men. The mine is a large and steady producer, as is shown by the fact that the output for the past fiscal year is valued \$47,536, and promises in the near future to exceed this amount, as developments are being pushed steadily for this purpose.

WESTERN ZINC COMPANY.

The mines of this company are situated east of Joplin, but within the corporate limits of that city. The property has been worked for many years in a desultory manner by different companies and individuals, but latterly have been consolidated into one company, and under the present management, is being worked in a more systematic manner and with better results. Their sales for the past fiscal year amount to over \$69,000. The lease system and royalty prevail here, as they do all over the district.

LAWRENCE COUNTY.

CAMPBELL & CO. AND JNO. SCHMOOK MINING CO.

These two properties, of which Mr. Otto Schmoock is superintendent and agent, are situated at Aurora, Lawrence county, and are both doing well. The ore-producing shafts, of which there are twelve, being operated by the two companies, are down to an average depth of 100 feet, and give work to about 60 miners and 80 other employees.

The valuation of the output of Campbell & Co. is \$47,000, principally jack ore; that of the Schmoock Co. is \$35,000, consisting mostly of lead and silicate of zinc ore. What is said of the other mines in this section as to the low grade of the silicate ores is true of these properties also.

CLEVELAND & AURORA MINERAL LAND CO.

The mines of this company are situated near Aurora, and constitute another of Lawrence county's big producers. They have seventeen ore-producing shafts being operated at present, which are all well located and doing well, and every prospect of continuing to do so. This year they have turned out 1200 tons of jack, 2895 tons silicate of zinc and 381 tons of lead ore, making a total valuation of over \$59,000. The preponderance of silicate ores in this section makes the price of zinc ore lower than in the other portions of the southwest.

KENTUCKY MINING CO.

The mines of this company are located in Aurora also, and make a fair showing with their varied product. Their output this year is 145 tons silicate of zinc, 1041 tons zinc blende, 307 tons galena (lead) and 84 tons dry bone (lead), making a total valuation of over \$34,000. There are 13 shafts on the property which will only average 60 feet in depth but are well located and will, no doubt, make fully as large a return the coming year. This property is worked entirely by lessees.

TERRE HAUTE LAND AND MINING COMPANY.

The mines of this company are located near Aurora, Lawrence county, and are the largest producers this year in that county, producing 566 tons of jack, 1563 tons silicate of zinc, and 477 tons of lead, all valued at more than \$64,000. They are working 40 men in their seven shafts, and judging from developments now being made, may reasonably expect a considerably larger return for the coming year. The silicate ores from this section being of lower grade than blende ores, makes the average prices of zinc ores in this section much lower than it is in sections producing the blende.

NEWTON COUNTY.

SPRING CITY MINING COMPANY.

The mines of this company are situated in Spring City, Newton county, and have made a very good showing for the year. There are five shafts on the property, producing ore, which give employment to 30 miners. The product of the mines is about equally divided between lead and zinc, that is, as regards value, though in tonnage the zinc production is double that of lead. The property is doing well, and promises to continue so. The year's output is valued at \$42,000.

ST. FRANCOIS COUNTY.

THE CENTRAL LEAD COMPANY.

This company is the owner of 1400 acres, situated in the very heart of this great Flat river basin. Over 50 years ago surface mining for galena was here carried on with the primitive methods then known. In 1876 a diamond drill was procured and a few holes bored to a depth of 240 feet. Some ore was encountered and a corporation organized, but at that time an effort to enlist sufficient capital to undertake development was unsuccessful. In 1890 the company commenced the sinking of a shaft to reach this ore at the 240-foot level, and resumed prospecting with a diamond drill. In the spring of 1892 the shaft was completed to a depth of 240 feet, but during the sinking of the shaft the prospecting had disclosed the existence of a larger and richer ore body at a depth of 360 to 380 feet, and it was decided to sink the shaft to the lower level. The shaft was completed to a depth of 380 feet in the summer of 1893, and in October the erection of hoisting plant and concentrating works was begun. These were completed in May of this year, and are models worthy of imitation. Although the concentrating works have capacity of but 100 tons of ore daily, and with all the delays necessarily incident to underground development and the operation of new machinery, this company has produced since May to date, September 1st, over 1,600,000 pounds of lead Concentrates, averaging over 68 per cent pure lead, and is now producing over 20,000 pounds daily. The concentrates are shipped to the Pennsylvania Lead company, Carnegie, Pa., where they are economically smelted with silver lead ores.

The ore body on which this company is now working has been developed by diamond drill and drifts, and is known to be 3000 feet long, over 200 feet wide and 23 feet thick. It is extremely probable that

other and perhaps greater and richer ore bodies exist on the remainder of this large tract—the prospecting thus far having been confined to an area of less than 30 acres. The richness of the ore, the regularity of the formation, and the excellent management at this mine justifies the prediction that it will soon become one of the largest producers of lead ore in the United States. The capital stock of the company is \$350,000, divided into 3500 shares of \$100 each, almost entirely owned in the city of St. Louis. The president is H. J. Cantwell; secretary, C. S. Rogers, and the mine and works are under the charge of Arthur Thacher, a mining engineer of recognized ability, who is ably seconded by his assistant, R. D. O. Johnson.

THE DESLOGE CONSOLIDATED COMPANY,

Of St. Francois county, of which Louis Fusz is president, and John M. Desloge superintendent, has its mine situated about one mile west of Desloge station, on the M. R. & B. T. R. R., from which point a switch has been laid to connect it with the works and mines.

The land on which this company is now operating was first prospected with the diamond drill by the Bogy Lead Mining Co. some years ago, but nothing of importance was done until the present company came into possession. Since that time, however, the value of the property has been greatly increased by the expenditure of a large amount of money in prospecting and developing, and in the erection of the mill, furnaces and buildings with which the property is now equipped. The shaft now being worked is down to a depth of 325 feet, where a large body of ore is being stoped. Another body of ore is found in this shaft at a depth of 250 feet, which is being also quite extensively worked at that level.

The ore is the same as that found in all the large mines of this section, viz.: lead ore disseminated through the solid limestone layers. The ore taken out is crushed at the mouth of the shaft, and taken thence by railroad to the mill for concentration. Their mill has a capacity of 300 tons daily, but it is proposed to increase it to double that capacity in the near future. There are three reverberatory furnaces on the premises, which are, however, only capable of reducing to lead part of the concentrates, the balance being sold.

DOE RUN LEAD COMPANY.

The mines of this company are situated at Doe Run, St. Francois county, the southern terminus of the M. R. & B. T. R. R. The principal part of their ore is now coming from Flat river, where the company has just finished sinking a shaft 450 feet deep.

This is the deepest shaft ever sunk in St. Francois county (very probably the deepest in the State), but promises to make fine returns for the money invested, as it is said to be the richest in ore of any shaft ever sunk in the disseminated lead-ore belt.

The ground is very wet, and a great amount of time and money was expended in prosecuting the work. It was found necessary at 90 feet to make a sump by blasting away one side of the shaft and put in a pump to lift the water to the surface. At 250 feet another one had to be put in, in the same manner. These, with the sinking one, made three large pumps necessary to keep the water away from the workmen; and even since the completion of the shaft, large pumps must be used to keep the mine dry enough to operate.

This shaft is 10 or 12 miles from Doe Run, to which point the ore is taken for concentration. The concentrating plant at Doe Run is a fine one, being second only to that of the St. Joseph Lead Company in capacity and appointments, their smelting being done by the above-named company's furnaces at Herculaneum.

The mines produced this year 4500 tons of lead ore.

THE FLAT RIVER LEAD COMPANY.

The property of this company embraces 1295 acres of land, all in one body, and is located in the great Flat River district, St. Francois county, Missouri, 65 miles from St. Louis.

It is bounded on three sides by the following well-known properties: St. Joseph Lead Company (new mines), Desloge Consolidated Lead Company, and the Doe Run Lead Company. Within the past three years a great deal of money has been expended here in prospecting and developing the property. A shaft has been sunk to the depth of 332 feet, from which exceptionally fine ore has been taken from two different strata. Underlying the present workings, there still remains another stratum, rich in value, as has been shown by borings from the Diamond drill.

It is estimated that these strata embrace a total of 20 feet of very rich ore. The working plant is a complete one, embracing hoisting-engines, air compressor, air drills, boilers, shop, oil-house, powder magazine, reduction works with a capacity of 100 tons daily, smelter, saw-mill, water-pipe line, telephone line, office, boarding-house, twenty company houses, and the towns Leadville and Taylor Place.

The Mississippi River & Bonne Terre railway bisects this property, *having the right of way* through it for a distance of two miles, and have *put in a spur*, passenger and freight platform at the works.

THE LEADINGTON LEAD COMPANY,

Of St. Francois county, is one of the new companies of this section, and for the first time reports a product from its mine. The mine proper is situated on part of what was formerly known as the "McKee mines," and is about 2 miles distant (east) from Flat River station on the M. R. & B. T. R. R.

This company was first known as the "Farmington Prospecting and Mining Company," but in January, 1894, changed its name to that shown above. The company has a paid-up capital stock of \$150,000, with F. Rodach president, and S. P. Reynolds superintendent.

The one shaft on the property is down to a depth of 350 feet, with cage and ladder ways. They have also a mill of 100 tons capacity, which has been running steadily since last May, and turning out a very fair quantity of lead ore, their report of only one month's work showing 187 tons of clean lead ore ready for market.

ST. JOSEPH LEAD COMPANY.

The St. Joseph Lead company, whose property is situated in and around Bonne Terre, St. Francois county, Mo., is by far the largest producer of lead in the State, and very probably the largest in the world. Its product this year is over 18,000 tons of lead ore, all of which was smelted at their works, and which realized more than three quarters of a million dollars.

The ore obtained is known as disseminated lead ore, and occurs in this mine about 225 feet below the surface. In some places in the mine immense bodies of this ore are found; one, in particular, is considerably over 100 feet thick, and of unknown extent laterally, several hundred feet of it having been explored in different directions.

Beside the mines immediately around the mill, the company is working two other shafts, known as Nos. 7 and 8 respectively, the first being about one mile southwest of the mill; the other on what is known as the Crawley tract, situated on Flat river, about one mile east of the railroad station of that name, to which point it is connected by a switch. Both of these shafts promise rich returns.

The concentrating plant is one of the largest in the country, and all of the machinery used in driving its jigs, crushers, dynamos, etc., is of the best. Ten large Blake crushers, with an estimated capacity of 1000 tons of rock daily, are kept constantly working, to supply the jigs and tables by which the ore is separated from the rock. For a plant of this size very few workmen are to be seen, as from the time

the rock is put into the crushers to the time it is thrown over the dump, it is handled entirely by machinery.

The product of the concentrating plant is carried by the M. R. & B. T. railroad to the company's smelting works, which have recently been moved to Herculaneum, Mo.

MADISON COUNTY.

MINE LA MOTTE.

The mines of this company are situated in Madison county, on an old Spanish claim covering some 20,000 acres, and are at present owned by Mr. Rowland Hazard. These mines are by far the oldest in the State, having been worked continuously for more than 100 years, but continue to be one of its largest producers. It is the only one at present operated in Madison county, and seems to be the southern end of the great disseminated lead ore basin of St. Francois county.

The mine is very dry, and almost all its work done by hand, thus giving employment to about 180 miners. A new shaft has been sunk on the property this year, and about a mile of track built to connect it with the mill and furnaces.

All the ore is reduced to pig-lead, on the premises, and transported to market over the St. L., I. M. & S. Ry. Their product this year was 6,985,985 pounds of lead ore.

JEFFERSON COUNTY.

VALLE MINING COMPANY.

The Valle Mining Company's mines are situated on a line between St. Francois and Jefferson counties, and work is prosecuted in both, the company owning a large quantity of land.

This is the only mine in Southeast Missouri in which zinc is found in paying quantities, and their product of this ore is generally sold to the zinc smelters of Carondelet. Their lead ore is principally found in caves and in the clay near the surface, being, however, of very fine quality, and large masses of it are often found without a particle of gangue or rock attached. This product is smelted in Scotch hearth furnaces, and sent to market over the M. R. & B. T. R. R., which passes over the property. This year's output is 921 tons of zinc and 424 tons of lead ore.

ST. FRANCOIS COUNTY.

IRON.

As indicated in my last report, the iron mines of the State have suspended operation. Only one (the Iron Mountain) has reported this year, and that has since closed down; so that our iron-mining interests, which were once so large, are now at a stand-still. This is not on account of the exhaustion of the ore-bodies, but must be attributed to the low price of the metal and the great competition from other states.

FIRE-CLAY AND BUILDING-STONE.

In addition to the matter heretofore covered by reports from this office, I have this year given the results of some investigations regarding articles mined in the State, but not classed as minerals. These are the fire-clays and building-stones of our State, and also a very interesting article on tripoli, extracted from the "Scientific American."

The fire-clays form quite a product of Missouri. I have endeavored to collect as much information as possible regarding them, and the result is shown in a table appended with the others. This table I do not claim to be a full statement of the extent of that industry, but it is, at least, a beginning to a report which may be of value hereafter. The table shows that a product valued at \$193,000 was taken out this year, and from this, I think it evident that the industry is worthy of some attention.

The result of investigations in building-stone quarries is also shown in a table. This table, like the one mentioned above, is the first of its kind published by this office, and like it, may not, and no doubt does not, include the full information that future reports may be made to show. This, however, is a great industry, and as our State can be made to produce enormously in this line, it should not be overlooked. The State abounds in all kinds of building-stone. The granite formations in the southeast cover an indefinite amount of territory; sandstone is found in various parts of the State; and these, with the limestone with which the State is almost entirely underlaid, are all good building material. As the table shows, this branch of industry gave employment this year to 946 men, and shows also an output valued at nearly one-half million dollars.

Immediately following this will be found an article on "American Tripoli," by Mr. E. O. Hovey, published in a recent issue of the "Scientific American." This industry has heretofore been comparatively

overlooked in this State, and while not large at present, bids fair to become of much greater proportions.

The article copied will be found to give a very good general idea of it.

AMERICAN "TRIPOLI."

BY E. O. HOVEY.

Tripoli is a term which was originally applied to an infusorial earth, resembling clay or chalk in appearance, coming from the country of the same name in Northern Africa. It crumbles or powders easily between the fingers, is a little gritty to the teeth, and scratches glass when rubbed on it. This earth consists almost entirely of silica in the opal or soluble state, and is made up mainly of the siliceous skeletons of the minute animal organisms known as polycystines or radiolarians, and of the equally minute plants called diatoms. Similar deposits, frequently of great thickness, occur in many other parts of the world, notably in Barbadoes, Sicily, Calabria, Greece, and the Nicobar islands. The well-known "Barbadoes earth" consists mostly of these siliceous skeletons, but contains, besides, a variable proportion of the calcareous shells of foraminifera. This deposit rises to heights of more than 1000 feet above the level of the sea, while that of the Nicobar islands reaches an elevation of about 2000 feet. According to Haeckel, the eminent German naturalist, there are not less than four hundred, and there may be more than five hundred, species of polycystines in the Barbadoes earth, very many of which "are today extant and unchanged in the radiolarian ooze of the deep Pacific ocean." In Bohemia there is a celebrated deposit of tripoli ("Pöhlir-schiefer"), largely used as a polishing powder, which is composed almost entirely, if not entirely, of the siliceous framework of diatoms. In the United States there are great deposits of diatomaceous earth, near Richmond, Va., and Monterey, Cal., of which the former is about thirty feet thick, and extends for more than a hundred miles from north to south across the State, while the latter exceeds fifty feet in thickness and is of unknown extent. All the beds noted above are of Tertiary age.

Tripoli is used very extensively in the form of powder as an abrasive, and forms the base for many polishing pastes and other similar preparations. The extreme fineness of the natural grain, combined with the hardness of the individual particles, composed as they are of silica, gives this substance its advantages for this purpose. It is also largely employed in mixing nitro-glycerine in the manufacture of dynamite.

Within a comparatively few years there has developed at Seneca, in the extreme southwestern corner of Missouri, a large business in the quarrying and manufacture of a rock which is called "tripoli," for the want of a better term, and because the material, in some respects, resembles what has so long gone by that name. This rock appears to have been derived from the flint of the country rock, which is a cherty lower carboniferous limestone, by some process of decomposition which has left behind a bed of very fine-grained, rather soft, porous material, which has considerable strength when cut into disks and other forms. This particular deposit is known to underlie between 80 and 100 acres of land, as a rude ellipse, with its longest diameter approximately north and south. Numerous prospect holes show that the bed is from 2 to 4 feet below the surface of the ground, and that it varies from 10 to 25 feet in thickness, with an average of about 15 feet. The main quarry of the company working these beds at present shows a section 18 feet

A well sunk in the northern part of the property gave the following sec-

orth, from the surface.....	0— 4 feet.
tripoli".....	4— 20 "
ff red clay	20— 21½ "
red chert, clay and ocher.....	21½— 40 "
arty limestone.....	40— 98 "
arty limestone, bearing galenite.....	98—108 "
nestone	108—128 "
nestone, bearing galenite and sphalerite.....	128—128 "
t magnesian limestone.....	136—178 "

The drill was lost in this soft rock at about 173 feet. The first 53 feet of the all was sunk by digging, the remainder by using a six-inch plunger drill.

Not only is the bed of tripoli everywhere underlaid by a relatively thinatum of very stiff red clay, but it is transversed in every direction by seams e to two inches thick of the same substance. These seams and other joints vide the rock into masses which vary in size up to thirty inches or more in imeter. In color the material varies from an almost pure white, through a eam tint, to a delicate rose, depending, probably, on a difference in the small ount of iron present.

The rock is very even in texture, and is so minutely porous that it forms a ost excellent natural filter. Last year (1893) the American Tripoli Company, ich owns and operates this deposit, put on the market more than 20,000 disks, lindars and blotters. These articles are patented.

A second and fully as important a branch of this industry is crushing the ck and grinding it into flour, for use in polishing all kinds of metals, horn, shell, c. The company grinds the rock in a common mill, between burr stones, and ts it through two bolts of 70 and 120 mesh, similar to those used for bolting eat flour. Last year the company sold upward of 20,000,000 pounds of this ound and bolted tripoli flour.

A portion was scraped off from a crude piece of the rock and mounted for the icroscope. Examination with powers magnifying up to 450 diameters failed to ow any remains of the skeletons of radiolarians or diatoms. The particles were tremely minute, by far the most of them being not over 0.01 mm. (=0.0004 inch) diameter, though an occasional grain measured 0.03 mm. across, and one was 05 mm. through. The particles are doubly refracting and are probably chalce-my, while the infusorial tripoli consists of opaline silica.

The credit of developing this industry is due to Mr. T. T. Luscombe, of irthage, Mo., who is president of the American Tripoli Company. The quarries re first opened in 1872, but the great growth of the business has been within a ry few years. The company received a medal and diploma award at the World's ir, Chicago.—Scientific American.

From the following table it may be noticed that the average price received for zinc ore is quite low; this is due to the tabulation of all grades of ore under the one head of "Zinc Ore." To arrive at the tonnage and true price of high and low grade ores, the following additional showing is made necessary:

70,418½ tons zinc blende ore	was mined, and averaged	\$16.52 per ton.
18,732½ " silicate of zinc	" " " "	9.32 "

The average price of lead ore is affected, for same reason as that given for low price of zinc ore, but not to any great extent.

In this table the product of each county, in both lead and zinc is shown, together with the number of employes, kind of machinery used and the number of mines operated.

TABLE I—SHOWING (BY COUNTIES) PLANT, EMPLOYES, TONNAGE AND VALUE OF PRODUCT OF LEAD AND ZINC MINES IN MISSOURI FOR THE YEAR ENDING JUNE 30, 1894.

County.	No. of mines.	Machinery in use.				Employees.			No. of men prospecting.	Total tons of lead ore.	Total tons of zinc ore.	Av. price per ton at mines.		Amount received for		Total amount received for year's output of lead and zinc ores.
		Boilers.	Pumps.	Crushers.	Steam-jigs.	Miners.	Other employees.	Total.				Lead ore.	Zinc ore.	Lead ore.	Zinc ore.	
Franklin.	1	4	2	2	27	5	10	15	4	133	1,197	\$34 00	.....	\$4,500 00	.....	\$4,500 00
Greene.	2	.....	.....	.....	.....	22	15	37	.....	102½	.....	.....	.....	3,499 00	.....	34,775 88
Jasper.	392	223	117	101	122	1,882	654	2,416	659	14,769	63,877	\$5 28	\$16 11	5,20,833 45	.....	1,550 00
Jefferson.	10	.....	.....	.....	.....	75	15	90	4	424	921	40 00	12 00	16,900 00	.....	25,708 55
Lawrence.	30	38	18	16	9	553	261	814	88	3,463½	15,553½	\$5 32	12 34	125,979 42	.....	317,498 00
Madison.	3	7	6	1	12	180	63	243	9	1,690½	7,520½	.....	.....	104,790 00	.....	104,790 00
Newton.	88	31	28	10	12	286	75	361	69	3,413	.....	.....	.....	67,841 88	.....	141,357 14
St. Francois.	7	41	52	25	151	684	618	1,302	14	29,129½	.....	.....	.....	1,067,879 80	.....	1,067,879 80
Washington.	58	2	2	1	24	124	8	132	65	1,704½	100	\$3 88	.....	67,785 50	.....	67,785 50
Wright.	2	.....	.....	.....	.....	10	5	15	.....	.....	.....	.....	14 00	.....	.....	1,400 00
Total.	553	348	222	156	957	3,421	1,644	5,065	912	52,003½	89,150½	\$7 48	\$15 00	1,949,668 56	1,337,910 38	3,287,578 92

TABLE II.

This table furnishes the output of both lead and zinc ores for the past six years—1889 to 1894 inclusive.

In making a comparison it will be found that the production of zinc ore during the past year is much less than for either of the four preceding years. The decline in price is the sole cause for the falling off in production, as operators would not mine the ore at prices offered for it.

Lead ore production has increased, and the output for the past year is in excess of the amount produced in any former year. The price of lead ore has also declined, but relatively not to the extent experienced in zinc ore. One reason for the increased production this year, is that operators of lead and zinc ore mines in Southwest Missouri have allowed the zinc mines to remain idle, while they mined lead ore in preference, because it was more profitable at the prices offered.

TABLE II—COMPARATIVE TABLE OF LEAD AND ZINC PRODUCT OF MISSOURI, 1889 TO 1894, INCLUSIVE.

TABLE II.—COMPARATIVE TABLE OF LEAD AND ZINC PRODUCT OF MISSOURI, 1889 TO 1894, INCLUSIVE.												
County.	Tons mined.											
	Lead ore.					Zinc ore.						
	1889.	1890.	1891.	1892.	1893.	1894.	1889.	1890.	1891.	1892.	1893.	1894.
Barry.....	.....	80	20	84	.....	.....	180	80	575	192.50	.....	.....
Christian.....	.....	46	46	.....	.....	.....	.....	100	40	.....	.....	.....
Cole.....	.....	55	57	58	.....	.....	174	1,647	1,273	108	220	.....
Dade.....	.....	.....	281	180	.....	138	.....	553	1,071	898	60	.....
Franklin.....	.....	300.1	300.1	408.11	.....	102%	.....	74,141.4	95,376	106,014.01	82,587.2	63,877
Greene.....	70.5	840.6	7,891	11,590	10,241	14,792	89,183	2,614	2,116	2,075	1,662	921
Jasper.....	5,380.2	7,159.8	4,497	5,730	1,082.7	424	2,085	12,877.1	15,361.62	18,361.28	16,178.8	15,635%
Jefferson.....	839	977	481	419	2,192.6	8,567	.....	.....	40	.....	.....	.....
Lawrence.....	1,881.8	3,873.4	4,181.61	4,468.25	4,165.9	8,498	15.5	.....	.....	.....	.....	.....
Madison.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morgan.....	8,716	2,082.6	2,431.81	25.10	.....	.....	.....	.....	.....	.....	.....	.....
Monroe.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monticau.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Perry.....	1,868.3	1,767.5	1,502.6	1,219.68	1,457.1	1,690%	6,980.2	8,285.4	7,900.7	8,842.75	8,048	7,620%
St. Francois.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wright.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lead ore.....	4,489.3	12,899.2	16,935.19	49,638.42	40,287.6	52,008%	82,587.2	100,248.1	123,752	181,457.64	108,591	89,150%
Pig lead.....	20,440.2	20,451.4	19,868.81	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total lead ore and pig lead.....	34,909.5	33,350.6	36,804	.....	.....	.....	.....	.....	.....	.....	.....	.....

Total receipts at
of lead and zinc
Year 1894

TABLE IV—SHOWING THE PLANT, NUMBER OF EMPLOYES, TONNAGE
MISSOURI FOR THE YEAR

FRANKLIN

Name of mine, company or proprietor of mine.	Name of lessee or operator of mine.	Shafts operated.		Machinery in use.			
		Number	Av. depth in ft.	Boilers	Pumps	Crushers	Steam-jets
J. H. Bartle.....	Vieman & Co.....	1	40	...	...	...	...

GREENE

R. P. Boyer.....	R. P. Boyer.....	1	40	2	1	1	3
The Suffolk Lead & Zinc Co.....	The Suffolk Lead & Zinc Co.....	1	40	2	1	1	24
Totals.....		2	...	4	2	2	27

JASPER

American Mining Co.....	American Mining Co.....	2	175	3	2	...	...
A. B. P. Mining Co.....	F. L. Yale.....	1	50	1	1	...	...
Alba Co.....	Alba Co.....	3	180	4	2	4	5
Blende Mining Co.....	Blende Mining Co.....	2	175	2	1	...	...
Cave Springs Mining Co.....	Cave Springs Mining Co.....	40	160	18	12	12	...
Center Creek Mining Co.....	Center Creek Mining Co.....	17	150	19	3	11	11
Chatham Mining Co.....	Chatham Mining Co.....	2	93	1	1	...	...
Clover Leaf Mining Co.....	Clover Leaf Mining Co.....	1	120	2	2	1	...
Cottonwood mines.....	Guengerich & Gregg.....	4	120	1	1	...	...
Daugherty & Davey.....	Daugherty & Davey.....	9	110	2	1	...	...
Daugherty, Davey & Daugherty.....	Daugherty, Davey & Daugherty.....	5	190	4	1	3	3
Davey, Tower & Co.....	Davey, Tower & Co.....	25	170	36	2	12	11
Eleventh Hour Mining Co.....	Eleventh Hour Mining Co.....	1	135	2	1	...	...
Germania Mining Co.....	Germania Mining Co.....	38	90	19	20	7	19
Granby Mining and Smelting Co.....	Granby Mining and Smelting Co.....	4	180	3	1	1	1
Harden Mining Co.....	M. L. Harden & Co.....	5	85	6	2	...	...
Harrison & Spencer.....	Harrison & Spencer.....	10	35	...	...	...	...
Hatfield & Lawrence.....	F. L. Yale.....	1	140	1	1	...	1
Home Mining Co.....	Home Mining Co.....	1	150	2	3	4	4
Inlising mine.....	A. O. Inlising & Co.....	5	115	4	2	1	5
Indiana & Missouri Mining Co.....	Indiana & Missouri Mining Co.....	6	80	3	3	...	...
Jacobs Bros.....	Jacobs Bros.....	2	168	1	1	1	2
Lewis, J. F.....	J. F. Lewis.....	12	90	2	2	1	2
Lichliter & Lear.....	Lichliter & Lear.....	12	100	2	2	2	1
Mohaska Mining Co. (limited).....	Mahaska Mining Co. (limited).....	12	60	2	2	2	1
Margerum Mining Co.....	Margerum Mining Co.....	5	100	2	6	2	1
Modat & Watkins.....	Modat & Watkins.....	2	80	3	1	1	1
Moonshine Mining Co.....	Deihl & Co.....	1	185	2	1	1	4
Mound City Mining Co.....	Mound City Mining Co.....	2	100	2	2	2	9
O'Keefe mine.....	Guinn & O'Keefe.....	6	160	5	1	1	11
Perry mine.....	E. N. Perry.....	20	100	25	10	10	10
Rex Mining and Smelting Co.....	Rex Mining and Smelting Co.....	9	160	6	3	4	8
Richland Mining Co.....	Richland Mining Co.....	4	55	2	...	...	...
Scotia Mining Co.....	H. H. Gregg & Son.....	3	140	3	2	1	3
South Joplin Lead and Zinc Co.....	South Joplin Lead and Zinc Co.....	4	45	1	4	1	7
Swartz, P. L.....	Brown & Farwell.....	36	30-165	10	11	4	7
The Empire Zinc Co.....	The Empire Zinc Co.....	4	160	3	1	...	...
The Get There Mining Co.....	James O'Neil.....	6	150	...	...	...	...
Tower, Davey & Co.....	Tower, Davey & Co.....	7	200	9	2	6	6
Troup Mining Co.....	Troup Mining Co.....	1	220	2	3	2	4
Victor Mining Co. (incorporated).....	Victor Mining Co.....	2	150	1	1	...	...
Wearich Mining Co.....	Wearich Mining Co.....	1	100	1	5	1	...
West Joplin Lead and Zinc Co.....	Portland Mining Co. (lessee).....	10	75	1	4	1	...
Western Zinc Co.....	Western Zinc Co.....	...	...	...	...	...	...
Totals.....		332	...	223	117	161	12

AND THE VALUE OF THE LEAD AND ZINC PRODUCT FROM MINES IN
ENDING JUNE 30, 1894.

COUNTY.

Employees.			No. of men prospecting on land of company...	No. of tons of ore mined.		Am't rec'd per ton at mine.		Amount received for the total output of		Total receipts from the year's output of lead and zinc.....
Miners.....	Other employees	Total		Lead.....	Zinc	Lead	Zinc	Lead.....	Zinc	
5	10	15	4	183	.....	\$33 00	.....	\$4,500 00	.....	\$4,500 00

COUNTY.

10 13	12 3.	22 15	.....	100 2%	1,100 97	34 00 36 00	17 50 18 00	3,400 00 99 00	19,250 00 1,746 00	22,650 00 1,845 00
22	15	37	.....	103%	1,197	.....	.....	3,499 00	20,996 00	24,495 00

COUNTY.

25	5	30	5	.....	200	.....	18 00	.....	3,650 00	3,650 00
10	.....	10	8	54	20	36 00	16 50	1,958 66	530 00	2,288 66
20	20	40	3	.....	387	.....	16 51	.....	6,388 96	6,388 96
12	10	22	.....	94	478%	36 64	18 13	3,444 16	8,679 73	12,123 89
17	17	34	.....	4	417	35 00	17 25	140 40	7,193 25	7,333 65
200	100	300	20	725%	10,044%	37 18	16 78	26,825 37	158,512 21	185,337 58
240	9	249	16	439	8,166%	35 35	16 60	15,518 65	135,558 36	151,077 01
5	.....	5	4	32%	.....	36 00	.....	1,170 00	.....	1,170 00
4	2	6	.....	.....	83	36 40	13 20	19 00	1,361 20	1,380 20
16	2	18	.....	271%	185	35 50	16 00	9,629 25	2,160 00	11,789 25
38	3	41	2	443%	113	35 50	15 50	15,735 25	1,751 50	17,486 75
40	15	55	5	95%	968%	35 50	15 00	3,387 76	14,520 50	17,908 26
200	50	250	100	880	8,503	37 00	16 80	32,560 00	142,850 40	175,410 40
7	1	8	.....	10%	52%	34 00	16 50	365 50	866 00	1,231 50
150	40	190	50	791	4,358	34 00	9 00	26,894 00	59,220 00	66,114 00
70	2	72	4	234%	557%	34 00	16 00	7,973 00	8,916 00	16,889 00
55	.....	55	10	1,048%	225%	37 50	15 30	39,318 75	3,455 96	42,774 71
30	10	40	60	99	21	28 00	18 00	2,772 00	578 00	3,350 00
.....	4	4	4	3	3%	40 00	21 65	120 00	70 36	190 36
15	20	35	.....	.....	940	.....	18 75	.....	17,625 00	17,625 00
20	1	21	.....	117	107%	32 28	14 69	3,775 76	1,575 50	5,351 26
50	10	40	20	1,048%	225%	37 50	15 30	39,318 75	3,455 96	42,774 71
18	18	36	1	40	912%	40 00	18 00	1,600 00	16,430 00	18,030 00
8	4	12	10	.....	102	.....	13 00	.....	1,326 00	1,326 00
20	10	30	15	204%	148%	30 62	14 35	6,281 79	2,134 56	8,396 35
60	10	70	40	2,085	109	35 16	12 00	73,308 60	1,308 00	74,616 60
10	2	12	16	4	125%	35 00	15 80	140 00	1,982 90	2,122 90
6	3	9	.....	95%	58%	35 00	15 50	3,333 75	903 00	4,236 75
14	8	22	.....	108%	1,386	39 50	17 20	4,275 87	23,889 20	28,165 07
9	11	20	5	223%	274%	35 64	15 98	7,974 45	4,385 55	12,360 00
6	2	8	.....	178%	3,720	31 70	17 19	6,202 65	63,856 80	70,059 45
200	100	300	25	1,182	6,712	35 54	17 12	42,008 28	114,909 44	156,917 72
40	5	45	10	1,073	49%	35 52	13 50	38,112 96	671 50	38,784 46
25	3	28	2	11%	600	35 12	17 00	343 75	10,200 00	10,543 75
6	10	16	.....	71	1,089%	33 74	17 00	1,107 94	18,536 29	19,644 23
20	2	22	.....	16	180	36 00	13 00	576 00	2,340 00	2,916 00
40	30	70	156	726%	6,254%	34 66	16 81	25,169 33	105,133 10	130,302 43
16	3	19	8	54	57	35 00	15 00	1,896 47	855 00	2,751 47
35	14	49	.....	279%	570	35 50	16 25	4,967 51	9,262 50	14,230 01
50	6	56	.....	633%	1,520%	35 63	14 70	22,562 70	22,351 35	44,914 05
20	15	35	.....	34%	2,510	36 00	18 94	1,251 98	46,284 40	47,536 38
10	.....	10	5	48	60%	34 00	15 50	1,632 00	937 50	2,569 50
15	.....	15	35	19%	34%	36 00	16 50	693 00	560 00	1,253 00
.....	7	7	20	1,281%	1,386%	38 27	16 30	46,488 16	22,616 50	69,104 66
1,832	584	2,416	669	14,762	63,877	35 28	16 11	520,833 45	1,023,342 48	1,550,175 93

EMPLOYES, TONNAGE

JEFFERSON

Name of mine, company or proprietor of mine.	Name of lessee or operator of mine.	Shafts operated.		Machinery in use.			
		Number	Av. depth in ft	Bollers	Pumps	Crushers	Steam-jets
Valle Mining Co.	Valle Mining Co.	10	100	...	...	...	...

LAWRENCE

Berry, Franklin	B. A. Berry	8	35	...	...	...	...
Brinkerhoff Zinc Co	Brinkerhoff Zinc Co	6	80	4	1	4	3
Campbell & Co	Campbell & Co	3	100	3	2	2	1
Cleveland & Aurora Mineral Land Co.	Cleveland & Aurora M. L. Co.	17	95	7	2	4	1
Dayton Mining Co	C. M. Dayton	2	40	...	...	...	...
Decatur Lead and Zinc Co.	Decatur Lead and Zinc Co.	5	70	...	...	...	...
Elliott mine	S. G. Elliott	2	30	...	...	...	...
Kentucky Mining Co	Kentucky Mining Co	13	60	3	2	...	2
Lenhard, Newman & Falk (Black land)	Lenhard, Newman & Falk	10	75	2	1	1	...
Midland Mining Co	Midland Mining Co	2	50	...	...	...	...
Mt. Vernon Mining Co	Mt. Vernon Mining Co	1	150	1	1	1	2
St. Louis-Aurora Mining Co	St. Louis-Aurora Mining Co	3	80	6	2	1	...
Schmook Mining Co	John Schmook Mining Co	9	100	3	...	1	...
Terre Haute Land and Mining Co	Terre Haute Land and Mining Co	7	105	7	2	1	...
Statta City Mining Co	J. R. Stevens	2	120	2	...	1	...
Totals	90	88	18	16	9

MADISON

Mine La Motte, Rowland Hazard	Rowland Hazard	3	120	7	6	1	12
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NEWTON

Granby Mining and Smelting Co.	Granby Mining and Smelting Co.	38	90	18	20	6	10
Gregg mines	H. H. Gregg	1	40	...	...	...	...
Gobler mines	H. Gross, trustee	1	100	1	1	...	...
Little Nugget Mining Co	Little Nugget Mining Co	1	110	...	1	...	...
Saginaw Lead and Zinc Co	Monte Carlo Mining Co.	3	50	1	1	...	...
Spring City Mining Co	Spring City Mining Co	5	135	7	3	3	2
The Roaring Spring Land and M. Co ..	The Roaring Spring L. and M. Co ..	9	65	4	2	1	...
Totals .....	.....	58	.....	31	28	10	12

AND VALUE—Continued.

COUNTY.

Employees.			No of men prospecting on land of company...	No. of tons of ore mined.		Am't rec'd per ton at mine.		Amount received for the total output of		Total receipts from the year's output of lead and zinc
Total	Other employes	Miners.....		Lead.....	Zinc	Lead	Zinc	Lead	Zinc	
75	15	90	4	424	921	\$40 00	\$12 00	\$16,960 00	\$11,052 00	\$28,012 00

COUNTY.

8	4	12	9	183	23½	34 00	8 00	6,222 00	188 00	6,410 00
20	15	35	8	4	216½	23 18	14 00	92 72	3,024 00	3,116 72
					z 2,052		z 15 48		3,764 96	
30	50	80	.....	802½	524	35 20	9 20	10,639 20	4,820 80	47,224 96
					1,200½		15 50		18,611 62	
30	45	75	6	381½	2,895	35 00	9 50	13,852 50	27,502 50	59,466 62
6	1	7	7	108½	32	28 40	6 50	3,074 30	208 00	3,282 30
10	10	20	15	28½	38½	36 50	9 00	1,045 00	344 25	1,389 25
6	.....	6		110½	6	25 00	9 00	2,762 50	54 00	2,816 50
				306½	1,041½	36 50	18 00	11,187 25	18,742 50	
50	3	53	20	84½	145½	18 00	9 00	8,103 49	1,309 50	34,841 74
16	18	34	6	548	251½	36 30	9 75	19,892 40	2,478 94	23,371 84
5	3	8	1	38½	93	35 00	9 50	1,356 50	883 50	2,240 00
12	2	14	3	37½	364½	35 00	16 50	1,812 50	6,014 25	7,326 75
					256		10 67	.....	2,731 52	
30	30	60	13	421½	320	37 76	8 67	16,915 84	2,774 40	21,421 76
					281		16 44		4,618 64	
30	30	60	.....	491	1,803½	35 98	9 81	17,556 36	12,787 33	34,962 83
					1,131½		15 52		17,557 00	
40	50	90	.....	477	3,125½	35 46	9 62	16,914 42	30,070 12	64,541 54
.....	.....	.....	.....	44	232	35 30	22 58	1,553 48	5,258 80	6,791 74
293	261	554	88	3,667	15,535½	35 32	12 34	125,979 42	191,724 13	317,703 55

COUNTY.

180	58	283	9	8,498	104,790 00	104,790 00
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COUNTY.

145	40	185	50	791	4,358	34 00	9 00	26,894 00	39,220 00	66,114 00
8		8		42½		35 00		1,496 50		1,496 50
23		23			1,000		10 00		10,000 00	10,000 00
15	2	17			58½		17 50		1,023 75	1,023 75
5	2	7	6	48½		22 88		995 89		995 89
30	25	55	5	616	1,232	35 00	17 00	21,560 00	20,944 00	42,504 00
75	6	81	8	197	872	35 00	14 00	6,895 00	12,208 00	19,103 00
296	75	371	69	1,690½	7,520½			57,841 39	83,395 75	141,237 14

EMPLOYES, TONNAGE

ST. FRANCIS

Name of mine, company or proprietor of mine.	Name of lessee or operator of mine.	Shafts operated.		Machinery in use.			
		Number	Av. depth in ft.	Boilers	Pumps	Crushers	Steam-jets
Central Lead Co.	Central Lead Co.	1	370	5	10	3	16
Desloge Consolidated Lead Co.	*Desloge Consolidated Lead Co.	1	325	6	7	2	20
Doe Run Lead Co.	†Doe Run Lead Co.	2	386	10	10	8	22
Leadington Lead Co.	Leadington Lead Co.	1	350	2	3	1	11
St. Joseph Lead Co.	†St. Joseph Lead Co.	1	225	15	15	10	66
Flat River L. Co. (Wm. Taylor, owner)	*The Flat River Lead Co.	1	330	3	7	1	8
Totals.		7		41	52	25	151

WASHINGTON

Cyclone mine.	M. M. Flynn	2	40				
*Long, James	James Long	2	20				
Long, William	William Long	2	15				
McArthur, A. P.	A. P. McArthur	14	10-100				
Palmer Lead Co.	Palmer Lead Co.	10	5-150	2	2		
Shibboleth Lead Mining Co.	Shibboleth Lead Mining Co.	8	8-140				
Union Mining & Smelting Co.	Union Mining & Smelting Co.	9	10				
White, Mrs. L. J.	Thos. S. White & Co.	1	50				
*Higginbotham mines	Z. T. Higginbotham	10	30				
Totals		58		2	2		

WRIGHT

Dodson Lead & Zinc Co.	Dodson Lead & Zinc Co.	2	136	2	2	1	24
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* Company smelts its own ores and price given is that of smelted product.

† Company smelts part of its ores.

AND VALUE—Continued.

COUNTY.

Employees.			No. of men prospecting on land of company...	No. of tons of ore mined.		Am't rec'd per ton at mines.		Amount received for the total output of		Total receipts from the year's output of lead and zinc.....
Miners.....	Other employees	Total.....		Lead.....	Zinc.....	Lead.....	Zinc.....	Lead.....	Zinc.....	
80	50	80	.....	350	.....	28 00	.....	9,100 00	.....	9,100 00
70	75	145	.....	2,250	.....	30 00	.....	67,500 00	.....	67,500 00
168	111	277	.....	4,500	.....	.....	.....	190,000 00	.....	190,000 00
25	90	45	.....	187½	.....	28 00	.....	5,000 00	.....	5,000 00
260	312	572	14	18,069	.....	.....	.....	763,279 80	.....	763,279 80
83	50	83	.....	750	.....	30 00	.....	22,500 00	.....	22,500 00
584	618	1202	14	26,128½	.....	.....	.....	1,057,879 80	.....	1,057,879 80

COUNTY.

14	.....	14	10	144	.....	34 00	.....	5,000 00	.....	5,000 00
12	.....	12	.....	171	.....	34 00	.....	5,814 00	.....	5,814 00
9	.....	9	.....	185	.....	30 00	.....	4,050 00	.....	4,050 00
6	.....	6	.....	101½	.....	35 00	.....	3,552 50	.....	3,552 50
30	8	38	.....	350	.....	34 00	.....	12,000 00	.....	12,000 00
11	.....	11	.....	167½	.....	34 00	.....	5,686 50	.....	5,686 50
5	.....	5	.....	62½	.....	34 00	.....	2,125 00	.....	2,125 00
2	.....	2	.....	37½	.....	34 00	.....	1,313 50	.....	1,313 50
35	.....	35	55	536	.....	34 00	.....	18,244 00	.....	18,244 00
124	8	132	65	1,704½	33 88	57,785 50	57,785 50

COUNTY.

10	5	15	100	14 00	1,400 00	1,400 00
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TABLE VII—CLAY MINES.

Name of operator.	Postoffice address.	Kind of clay.	Average number of men..	No. tons mined	Average price	Value	Remarks.
Christy Fire Clay Company.....	St. Louis	Fire-clay.....	46	30,000	\$1 00	\$30,000	One shaft 70 feet deep
Evans & Howard Fire Brick Company.....	"	"	33	31,229	1 00	31,229	Two shafts 60 feet deep
Parker Russell Mining and Manufacturing Company.....	"	"	13	16,920	1 00	16,920	One shaft 135 feet deep
Blackmer and Post Pipe Company	"	"	14	24,000	50	12,000	Strip the surface.....
Laclede Fire Brick Company	"	"	45	131,000	70	91,700	Drift in hill
Jacob Tharp & Co.....	"	"	12	13,000	1 00	13,000	Shaft 33 feet deep.
Totals.....	.....	.....	163	245,149	79	133,549	

TABLE VIII.—STONE QUARRIES.

Name of operator.	Kind of stone.	Postoffice address.	No. of quarrymen.	Other empl.	Total	Total value of stone.	Remarks.
Merramec Highlands Co.	Limestone.....	M. Highlands	40	5	45	\$30,000	Oolitic and blue limestone used.
Mason Marble Co.	White limestone..	South Greenfield, ..	25	6	31	18,895	Burlington limestone.....
H. J. Hart	Limestone.....	Louisiana	110	25	135	100,000	Louisiana
Hannibal Lime Co.	" ..	Hannibal.....	100	50	150	80,000	" ..
Carthage Quarry and Construction Co.	" ..	Carthage	6	19	25	17,433	" ..
Carthage Marble and White Lime Co.	" ..	" ..	9	13	22	34,453	" ..
Carthage Stone Co.	" ..	" ..	12	18	30	54,416	" ..
Lawrence, Bruce	Sandstone	St. Louis	12	18	30	17,500	" ..
3000 Level Quarry and Mining Co.	Granite.....	Warrensburg	4	25	29	23,213	Quarry is located at Warrensburg ..
Schneider Granite Co.	" ..	St. Louis.....	95	180	275	125,000	" ..
Syenite Granite Co.	" ..	" ..	100	150	250	33,433	" ..
Totals			437	510	947	\$74,310	

Many quarries were closed during the whole year of 1893, on account of hard times. As no building and no improvements going on, stone could not be sold.

TABLE IX—IRON ORE, ST. FRANCOIS COUNTY.

Name.	Operator.	Depth of shafts	No. shafts	Boilers	Pumps	Crushers	Jigs	No. miners	Other employes	Total tons mined.	No. tons sold.
Iron M. Co.	Iron M. Co.	200	5	12	2	6	12	71	49	45,727	1,859
Average price per ton										\$3 70	
Total amount received for ore										6,881 50	

ACCIDENTS.

The table of accidents shows a total of 44 casualties to have occurred in the past year—a very small proportion considering the number of men employed. Of these, 17 were fatal and 27 non-fatal, and out of this total but two were reported to be insured—one, a policy of \$1000, the other an accident policy of \$4.50 per week for a damaged foot. There were no great catastrophes, injuring or destroying the lives of several persons at one time; in fact nothing more than the usual accidents incidental to mining. Most of the cases reported show that the accident was due to the carelessness or recklessness of the party injured.

While this table is to the best of my knowledge correct, it is very probable that a number, especially of non-fatal accidents, are unreported. One reason for this is the fact that most of the mining, especially in the southwest, is done by sub-lessees, and when an accident happens to a man in a mine so operated, the mine-owner seldom hears of it, and consequently no report made to me.

I must notice here again, however, the difficulty experienced in getting reports of accidents from parties who should report them. Very few mine-owners or operators report accidents voluntarily, and it requires constant watchfulness, through the medium of the daily papers and other outside sources, to obtain any information of accidents whatever. On obtaining any information relative to the accident, and finding same not reported immediately, I have sent to the proper party for a full account, and so obtained report. By far the largest number of cases included in my statement were obtained by me in this manner. I must say, though, that even these requests of mine were very reluctantly complied with. That it is a very hard matter to obtain reports of this kind, is shown by the fact that in five out of the seventeen cases reported there was not even a coroner's inquest held. In Jasper county alone, three such cases occurred.

TABLE X—SHOWING ACCIDENTS IN LEAD AND ZINC MINES, BY COUNTIES, FOR YEAR ENDING JUNE 30, 1894.

JASPER COUNTY.

Name of employer.	Name of company.	Occupation.	Am't insured.			Cause of accident.	Coroner's verdict.
			Insured.	Yes..	No..		
			No. children.	Fatal.	Non-fatal.	Married.	Single.
			Age.				
James Meier	Empire land	Miner	30	1		Falling roof	Accidental
Jas. O. Johnson	Fry & Jacobs	"	22	1		Fell in shaft	His own carelessness
Hugh Means	Rex Mining Co.	Boas	22	1		"	"
M. A. Grant	Ellipse mine	Engineer				Falling roof	His recklessness
Henry Richards	Pineard ground	Miner		1		Fell in shaft	Accidental
Wm. Hackett	Troupe Mining Co	Foreman	38			Premature fire	"
Eugene Coker	"	Tub-rigger	38			"	"
G. M. Coppernith	Daisy mine	Miner	35	1		Rock fell on foot	"
Rob't. Bass	Mont City mine	"	22			Premature fire	"
John Graham	Tracy mine	"				Fell in shaft 140 ft.	No inquest
Hi. Talbot	Center Creek mine	"		1		Rock fell on head	"
Owen Watson	Center Creek mine	"				Fell in shaft	No inquest
Ben. Reyer	Tracy land	"				Falling roof—arm broken	"
Ice Walters	Chatham mine	"		1		Falling roof—foot mashed	"
Will Zieg	Eleventh Har	"				Caught in belt	"
Matt Zieg	Center Creek mine	Leaser				Rope broke	"
M. H. Harlan	Center Creek mine	Miner				Falling roof	"
Jim Long	Marguerite Mining Co	"				"	"
Jim Layhill	Eleventh Har mine	"				"	"
John Flaw	"	"				"	"
John Burke	Perry Land	"				Hand mached	"
John Waver	Center Creek mine	"				Falling roof	"
E. B. Allen	"	"				Fell in shaft	"
F. B. Mahan	"	"				Premature fire	"
Chas. Day	Swazee mine	"				"	"
Bert Gibson	Blenderville	"				Falling roof	"
John Daniels	Bailey & Dean	"				Struck by bucket	"
Van I. Davis	Owens & Co	"				Fell in shaft	"
Duncan Boggess	"	"		1		Premature fire	"
Ray Duson	Seelley & Cohenour	"				Broken leg	"
Ray S. Pullen	Jobe mine	"				Broken ribs	"
W. Fullz	Alba Co.	Laborer	26	1		Fall. g stone	"
Ge.	"	"				"	"
Totals			2	823	9	3	

* Insured for \$4.50 per w. e. k.

LAWRENCE COUNTY.

Geo. Roblnette	Aurora	Miner	1					Fell 80 feet	His own carelessness
Geo. Hillhouse	Vance land	"	1					Falling roof	No Inquest
Geo. Gorsege	Lenhard, Newman & Co.	Dirt-rustler	19	1				Siding down rope	
Thos. Wolfenbarger	B. O. Wheeler	Tub-rustler	17	1				Fell down shaft	
J. Smith	St. Louis-Aurora Mining Co.	Miner	52	1	1			Hand mached	
Fred Lewis	J. B. Segreest	"	20	1	1			Brake slipped	
Wm. McDermitt	"	"	20	1	1			Hit with hammer	
S. F. Damon	Otto Schmook	"	24	1	1			Struck in mouth with pick ..	
Chas. D. Wright	"	"	21	1	1				
Totals			6	1	5	4			

ST. FRANCOIS COUNTY.

Frank Brinom	Desloge mine	Foreman	30	1	1	2		Fell in shaft	His own carelessness
Geo. Peary	Taylor M. Co	Miner	24	1	1	1		Rock fell on head	No Inquest
Sam Benham	St. Joseph L. Co	Car dumper	40	1	1	3		Run over by car	His own carelessness
Mike Rathe	Leadington Lead Co	Miner	37	1	1	2	1	Fell down shaft	Accidental
James Mills			28	1	1	3			
Totals			1	4	1	10	1		

RECAPITULATION OF ACCIDENTS IN LEAD AND ZINC MINES.

Number of non-fatal accidents.....	29
Number of fatal accidents	17
Total number of accidents	46
Number of single men injured fatally.....	9
Number of married men injured fatally	8
Total fatally injured.....	17
Number of wives made widows.....	8
Number of children made fatherless.....	13
Number of injured men carrying insurance.....	2
Amount of insurance, \$1000.....	
<i>Cause of accidents.</i>	
From falling roof.....	13
fall of rock.....	9
falling down shaft	10
premature blasts.....	6
slipping of brake.....	2
being struck with tools while at work.....	2
being caught by belt.....	1
broken rope.....	1
sliding down rope.....	1
being struck by descending bucket.....	1
Total number of men injured	46
<i>How injured men were employed.</i>	
Proprietor.....	1
Foremen	3
Miners	38
Engineer.....	1
Tub-rustlers	3
Car-dumper.....	1
Laborers	1
Total.....	46

NAME OF MINE OR OWNER, OPERATOR, POSTOFFICE ADDRESS, AND LOCATION OF MINE.

FRANKLIN COUNTY.

Name of mine or owner.	Operator.	Postoffice address.	Mine located at or near.
Bartle, I. H.....	I. H. Bartle.....	St. Clair.....	St. Clair.....

GREENE COUNTY.

Bowyer mine.....	R. F. Bowyer.....	Springfield.....	Springfield.....
Suffolk Lead & Zinc Co.....	John N. Newcomb.....	Mumford.....	".....

JASPER COUNTY.

American Mining Co.....	C. E. Beach, secretary.....	Kansas City.....	Sherwood.....
A. B. P. Mining Co.....	F. L. Yale, manager.....	Joplin.....	Joplin.....
Alba Mining Co.....	George Dennison, president.....	Alba.....	Alba.....
Blende Mining Co.....	W. B. Jeffrey.....	Joplin.....	Joplin.....
Cave Spring Mining Co.....	W. E. Brinkerhoff, president.....	".....	".....
Cater Creek Mining Co.....	W. C. Stewart, treasurer.....	Webb City.....	Webb City.....
Cantham Mining Co.....	Jas. Smith, vice-president.....	".....	Webb City and Cartersville.....
Chayer Leaf Mining Co.....	E. M. Murray.....	Joplin.....	Joplin.....
Cottonwood Mining Co.....	C. W. Guengerich.....	".....	".....
Daugherty & Davy.....	W. A. Daugherty, secretary.....	Cartersville.....	Cartersville.....
Daugherty, Davy & Daugherty.....	".....	".....	".....
Davey, Tower & Co.....	Paul N. Davey, secretary.....	".....	".....
Davenport Hour Mining Co.....	J. S. Thombs, superintendent.....	Webb City.....	".....
Elemania Mining Co.....	Guy S. Farwell, superintendent.....	Joplin.....	Joplin.....
Garnby Mining and Smelting Co.....	Jno. P. Neville, president.....	St. Louis.....	Joplin and Oronogo.....
Griffin Mining Co.....	M. H. Hardin.....	Cartersville.....	Hardenburg.....
Harrison & Spencer.....	Wm. Leckie (owner).....	Joplin.....	Joplin.....
Helfeld & Lawrence.....	F. L. Yale, superintendent.....	".....	".....

NAME OF MINE, LOCATION, ETC.—Continued.

JASPER COUNTY.

Name of mine or owner.	Operator.	Postoffice address.	Mine located at or near.
Home Mining Co.....	Claycomb & Staples, managers.	Joplin	Joplin
Idling Mine.....	A. O. Idling.....	Carthage	Carthage
Indiana & Missouri Mining Co.	Wm. H. Dyer, secretary	Joplin	Joplin
Jacobs Bros.....	C. O. Frye, superintendent.....	Webb City.....	Webb City.....
J. F. Lewis.....	N. B. Lewis.....	Joplin	Joplin
Lichliter & Lear.....	W. B. Jeffery.....	Webb City.....	Blendeville.....
Mahaaka Mining Co.....	John Dermott, secretary	Joplin	Oronogo
Margerum Mining Co.....	Moffitt & Watkins.....	Webb City.....	Joplin
Moffitt & Watkins.....	W. S. Paul, secretary	Joplin	Carterville.....
Moonshine Mining Co.....	Louis Helm, manager.....	Webb City.....	Joplin
Mound City Mining Co.....	J. B. Guinne, superintendent.....	Joplin	Carterville.....
O'Keefe mine.....	E. J. Tutty, superintendent.....	Webb City.....	Joplin
Perry Mining.....	E. D. Porter, president.....	Joplin	Carterville.....
Rex Mining and Smelting Co.....	J. M. Waugh, superintendent.....	Webb City.....	Joplin
Richland Mining Co.....	H. H. Gregg & Son.....	Joplin	Joplin
Scotts Mining Co.....	M. M. Hinton, superintendent.....	Joplin	Joplin
South Joplin Lead and Zinc Co.....	P. L. Swartz.....	Webb City.....	Carterville.....
Swartz, P. L. mine.....	W. C. Witherell, general manager.....	Webb City.....	Carterville.....
The Empire Zinc Co.....	Jas. O'Neil, manager.....	Carterville.....	Carterville.....
The Get There Mining Co.....	P. N. Davey, general manager.....	Webb City.....	Carterville.....
Tower, Davey & Co.....	S. H. Cobb, general manager.....	Webb City.....	Carterville.....
Troupe Mining Co.....	Thos. R. Cook, secretary.....	Joplin	Joplin
Victor Mining Co.....	D. K. Weirich, superintendent.....	Joplin	Joplin
Weirich Mining Co.....	D. L. Brewster, vice-president.....	Joplin	Joplin
West Joplin Lead and Zinc Co.....	Danl. Dwyer, general manager.....	Joplin	Joplin
Western Zinc Co.....			

JEFFERSON COUNTY.

Valle Mining Co.....	Louis Rozler.....	Valle mine.....	Valle mine.....
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LAWENCE COUNTY.

Berry, Franklin.....	B. A. Berry, superintendent.....	Aurora.....	Aurora.....
Brinkerhoff Zinc Co.....	F. H. Brinkerhoff, president.....	".....	".....
Campbell & Co.....	Otto Schmook, superintendent.....	".....	".....
Cleveland & Aurora Mining and L. Co.....	C. F. Johnston, superintendent.....	".....	".....
Dayton Mining Co.....	C. M. Dayton.....	".....	".....
Deatur Lead and Zinc Co.....	Geo. Van Riper, superintendent.....	".....	".....
Elliott mine.....	S. G. Elliott.....	".....	".....
Kentucky Mining Co.....	Geo. Van Riper, superintendent.....	".....	".....
Leonard, Newman & Falk.....	Jacob Phelen, superintendent.....	Aurora.....	Aurora.....
Midland Mining Co.....	C. F. Johnston, superintendent.....	".....	".....
Mt. Vernon Mining Co.....	J. B. Davis, superintendent.....	Mt. Vernon.....	Mt. Vernon.....
St. Louis & Aurora Mining Co.....	L. W. Hubbell, superintendent.....	Aurora.....	Aurora.....
Schmook, J., Mining Co.....	Otto Schmook, superintendent.....	".....	".....
Terre Haute L. & Mining Co.....	Otto Schmook, superintendent.....	".....	".....
Statts City Mining Co.....	Wm. S. White, president.....	".....	".....

MADISON COUNTY.

Mine La Motte.....	J. D. Sanders, superintendent.....	Mine La Motte.....	Fredericktown.....
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NEWTON COUNTY.

Granby Mining & Smelting Co.....	John P. Neville, president.....	St. Louis.....	Granby.....
Gregg mines.....	H. H. Gregg.....	Joplin.....	Jackson.....
Goble mines.....	C. Gross.....	Wentworth.....	Wentworth.....
Little Nugget Mining Co.....	W. J. Dawson, secretary.....	".....	".....
Little L. & Z. Co.....	S. L. & G. Co.....	Saginaw.....	Saginaw.....
Saginaw L. & Z. Co.....	J. W. Allen, secretary.....	Spring City.....	Spring City.....
Spring City Mining Co.....	E. Hedburg.....	Gregg.....	Gregg.....
Roaring Springs L. & M. Co.....			

NAME OF MINE OR OWNER, OPERATOR, POSTOFFICE ADDRESS, AND LOCATION OF MINE—Continued.

WASHINGTON COUNTY.

Name of mine-owner.	Operator.	Postoffice address.	Mine located at or near.
Cyclone mine.....	M. M. Flynn	Richwoods	Richwoods
Long, James.....	James Long	Potosi	Potosi
Long, William.....	Wm. Long	"	"
McArthur, A. P.....	Hugh McGregor.....	"	"
Palmer Lead Co.....	T. F. Blount, superintendent.....	Palmer	Palmer
Shibboleth Lead Co.....	J. B. Lathey, superintendent.....	Cadet.....	Cadet.....
Union Mining & Smelting Co.....	Alex. Harrison, superintendent.....	Old Mines.....	Old Mines.....
White, Mrs. J. L.....	"	"	"
Higginbotham mines.....	Z. F. Higginbotham	Fertile.....	Fertile.....

WEIGHT COUNTY.

Dodson Lead & Zinc Co.....	G. J. Roote, superintendent.	Mansfield.....	Mansfield.....
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ST. FRANCOIS COUNTY.

Central Lead Co.....	Arthur Thatcher, superintendent	Elvins	Flat River
Desloge Consolidated Lead Co.....	S. M. Desloge, superintendent.....	Desloge.....	Desloge.....
Doe Run Lead Co.....	F. P. Gravis, superintendent.....	Doe Run	Doe Run.....
Leadington Lead Co.....	S. P. Reynolds, superintendent	Leadington.....	Leadington.....
St. Joseph Lead Co.....	C. B. Parsons, superintendent.....	Bonne Terre.....	Bonne Terre.....
The Flat River Lead Co.....	Wm. R. Taylor, superintendent.....	Farmington.....	Flat River.....

GLOSSARY

MINING TERMS USED IN MISSOURI IN MINING AND SMELTING LEAD AND ZINC ORES.

nace—A reverberatory furnace used to melt lead in.

e—A pipe made of canvas, or a tin box, used in conveying ventilation to the workmen.

y—Any passage used for the passage of the air current.

zinc furnace—A furnace for the reduction of zinc in which the calcined ore is distilled in tubular retorts.

amp—Choke damp; carbonic acid (CO_2), often found in the bottom of old and unventilated workings. It supports combustion.

ack—Zinc blende.

an—A small centrifugal fan used to draw air through canvas pipes or wooden ducts to the workmen.

out shot—When a blast blows out without bringing down the ore, it is said to be a blown-out shot.

—The landing at the bottom of the ore slope; the floor; the bottom rock stratum underlying the ore deposit.

—The heading from which the ore is raised.

g ore—Hand process of crushing ore which do not occur free.

ae—Zinc silicate—carrying 52 per cent of zinc when pure.

furnace—A furnace used for roasting ore in order to drive off certain impurities.

r cave-in—After the ore has been mined, the overlying roof gives way, and is called a cave-in.

(1) The gravel-like tailings derived from the concentration of ores. (2) A low ore, often too poor to handle; the ore from concentration works.

—The amount of materials added to the furnace at one time.

A siliceous rock—often the gangue of lead and zinc.

g—Timbering a shaft with crib-work, commonly extends from the surface down to the bed-rock.

rating plant—A complete plant for sorting and preparing the ore for market, consisting of crushers, rolls and jigs.

Crop, or out-crop—Indications of an ore deposit sometimes observed upon the surface.

Crusher—A machine used for crushing ores and rock.

Cotton rock—(1) Decomposed chert. (2) A variety of earthy limestone.

Derriek—The structure erected to sink a drill-hole, and the frame work above shafts are sometimes called by this name.

Digging—Mining operations, excavating the ore or earth.

Dip—The angle of inclination of a mineral bed or vein measured from a horizontal line.

Drill—Any tool used for boring or drilling holes in rock or mineral.

Dry bone—Carbonate of lead.

Dump—A pile or heap of ore or waste, rock, etc. (2) The tippie by which the cars or ore-buckets are dumped.

Entry or drift—A water-level heading driven from the surface of bottom of shaft, through which the product is conveyed.

Face, or working face—The place at which work is being done; the ore-bearing stratum.

Flint—Chert rock.

Flintshire furnace—A kind of reverberatory furnace used for smelting lead ores.

Float ore—A term applied by miners to ore found loose in the clay or soil.

Flux—Iron ore, limestone and sand, which are added in various proportions to the charge in a furnace to make the gangue melt up and blow off easily.

Galena—Lead sulphide, an ore carrying 86 per cent of lead, when pure.

Hard lead—Lead containing certain impurities, mainly nickel, cobalt, antimony, etc.

Hoister—A machine used in hoisting the product. It may be operated by steam or horse-power.

Jack—Zinc blende.

Jig—A machine used for separating ores from worthless rock by means of their specific gravity.

Legs—Props on which collars in gangways rest.

Lagging—Small, round timbers, slabs or planks driven in behind the legs and over collars to prevent pieces of the roof or sides from falling through.

Mill cinder—The slag from the puddling furnace of a rolling mill, used as flux in lead smelting.

Mill run—The test of a given quantity of ore by actual treatment in a mill.

Matte—A compound of iron and other metals with sulphur, formed during lead smelting, in the slag furnace.

Mine—Any excavation made for the extraction of minerals.

Miner—The term is used to denote the workmen who mine the ore.

Mineral—A local term for galena or lead ore.

Mundic—Iron pyrites; bisulphide of iron.

Open cut—Any surface excavation.

Opening—A fissure or cave is often encountered in mining in the southwestern part of the State, and is locally known by this name.

Output—The mineral product of the mine.

Pebble jack—Zinc blende in small crystals or pebble-like forms that is not attached to rock, but is found in clay openings in the rock.

Percussion table—A kind of joting table used in separating very fine ores from slimes.

Pillar—A portion of ore left to support the roof.

Plat or map—A map of the surface and underground workings, or of either; to draw such a map from surveys.

Poling—The process of purifying lead by stirring it while melted with green poles, and skimming off the dross that rises to the surface.

Post or prop—An upright timber; applied particularly to the timbers used for propping the roof.

Prospect-hole—Any shaft or drift-hole put down for the purpose of prospecting the ground.

Rolls—Machinery for reducing disseminated ores, so the minerals can be separated from the waste.

Roof—The rock or stratum overlying the ore deposit or vein.

Seam—A fissure or joint, either empty or filled with foreign matter. (2) A stratified bed of mineral.

Screen—Any sieve, whether coarse or fine mesh or bars, or perforated sheet metal, used for separating minerals into different grades, according to size.

Sheave—A wheel with grooved circumference, over which a rope is turned, either for the transmission of power, or for hoisting.

Scraper—A local name given to parties who pick up the ore left on dumps.

Shot—A drill-hole charged and fired; injured by a shot.

Silicate—An ore containing about 50 per cent of zinc when pure.

Slime—Silt containing very fine ore, which passes off in the water from the jigs.

Slag—The gangue of the ore with the fluxes which are added in the furnace, and which combine to make a mass that is easily melted, which blows off, leaving the lead or other metal in a free state in the furnace.

Smitten—Fine gravel-like ore, occurring free in mud openings, or derived from the breaking of the ore in blasting.

Smithsonite—Zinc carbonate, carrying 56 per cent of zinc when pure.

Speiss—A compound of arsenic, iron and sulphur added to the charge sometimes to extract the nickel and cobalt in the ore.

Stuff—A common expression among lead and zinc miners when referring to minerals.

String-pump—A system of pumping whereby the motion of the engine is transmitted to the pump by timbers or stringers bolted together.

Stopping—After a heading has been driven, the underlying ore is mined out by stopping.

Tailings—Waste rock, dirt, etc., left after the minerals have been extracted.

Trolley—A small four-wheeled truck used for carrying the ore bucket underground.

Tiff—Calcite, or carbonate of lime.

Tuyers—The tubes through which the air is forced into a furnace.

Tub—Ore bucket used in hoisting.

Wash place—A place where the ores are washed and separated from the waste, usually applied to places where the hand-jigs are used.

Zinc ores—The various ores of zinc may be divided into: (1) The sulphide ores, or zinc blende—these are termed "black jack," "rosin jack," "steel jack," etc., from the color. The ore, when pure, carries 67 per cent zinc. (2) The oxidized ores, "calamine," or the silicates of zinc known as "silicate" and "smithsonite;" the carbonate of zinc also generally called silicate. These ores carry about 50 per cent of zinc.

MINING LAWS OF MISSOURI.

CHAPTER 115.

ARTICLE I—Mines and mining.

II—Safety and inspection of mines.

ARTICLE I.

MINES AND MINING.

SECTION

- 7034. Rights of miners and owners of mining lands—condition of permits.
- 7035. Forfeiture.
- 7036. Tender of payment.
- 7037. Notice to owner or lessee.
- 7038. Sale of ore.
- 7039. Injunction or restraining orders—notice of application to dissolve.
- 7040. Affidavit of course of drift and order to be made.
- 7041. Order to be read.
- 7042. Refusal to obey order a misdemeanor.
- 7043. Owner or lessee shall drain mine, etc.
- 7044. Scrapping for ore prohibited, etc.—penalty.
- 7045. Indemnity bond required to mine in certain cliffs, etc.—violation a misdemeanor—penalty.
- 7046. Notice of intention to mine, publication required.
- 7047. Petition to circuit court—court to fix and approve bond.

SECTION

- 7048. Testimony on application—bond, etc.—time granted.
- 7049. Bond required.
- 7050. Written permission of property owner—violation, misdemeanor—penalty, fines, etc.
- 7051. Costs attending notice.
- 7052. Diagram of mines, etc., to be filed in court.
- 7053. Application of article to mining companies.
- 7054. Screening coal before weighing prohibited.
- 7055. Weighman shall take an oath, etc.—penalty.
- 7056. Penalty for using false scales.
- 7057. Shall apply to loaders in certain mines.
- 7058. Checks redeemable in money or goods, etc.
- 7059. Employees to be paid monthly, etc.
- 7060. Refusal to redeem orders—penalty.

SEC. 7034. *Rights of miners and owners of mineral land—condition of permits.—*
When any person owning real estate in this state, or any person having a leasehold interest in such real estate for mining purposes by lease from the owner thereof, duly acknowledged and recorded in the county wherein the land lies, shall permit any person or persons, other than their servants, agents or employees, to enter and dig or mine thereon for lead ore or other minerals, with the consent of such owner or owners or lessees, he or they shall keep a printed statement of the terms, conditions and requirements upon which said lands may be mined or prospected, and the time during which the right to mine or prospect thereunder shall continue, posted or hung up in a conspicuous place, in plain, legible characters, in the principal office or place of business of such person or company in the county in which said lands are situated, or in a county contiguous thereto, and shall deliver to any person mining or prospecting, or about to mine or prospect on said lands, and requesting it, a printed copy of such statement. All persons digging or mining on said lands, after the posting up of such statement, shall be deemed to have agreed to and accepted the terms thereof, and shall, together with such owner or lessee,

be bound thereby, and upon failure or refusal to comply with the terms, conditions and requirements of such statement, he or they shall forfeit all right thereunder, and the owner or lessee, as aforesaid, of such lands, may re-enter thereon and take possession of the same; nor shall the receipt of any ore or mineral by any such owner or lessee, after any such forfeiture has been incurred, be deemed or taken as a waiver of such forfeiture. (R. S. 1879, § 6441—*a*.)

SEC. 7035. *Forfeiture*.—Whenever any such owner or lessee of real estate shall permit any person or persons, other than their servants, agents or employes, to enter and dig for lead ore or other minerals on such real estate, with his consent, but without such owner or lessee complying with the provisions of section 7034, and such person or persons having so entered upon said lands by the permission or consent of such owner or lessee as aforesaid, and having in good faith dug or opened any shaft, mine, quarry, prospect or deposit of mineral, or extended or opened from any shaft or mine any room, drift, entry or other excavation, he or they shall have the exclusive right as against such owner or lessee giving such permit or consent, and against any person claiming by, through or under such owner or lessee, to continue to work, mine and dig such shaft, mine, prospect or deposit of mineral so dug or opened by him or them as aforesaid, in said real estate, with a right of way over such lands for the purpose of such mining, for the term of three years from the date of the giving of such consent or permit: *Provided, however*, that if such person or persons, in each case so mining as aforesaid, shall fail or neglect to work or cause to be worked such shaft, mine, quarry, prospect or deposit of mineral for ten days, not including Sundays, in any one calendar month, after commencing said work, he or they shall forfeit all rights to work, mine or hold the same as against such owner or lessee, unless such failure or neglect was caused by unavoidable circumstances, or by the act of such owner or lessee or his agent, or unless such owner or lessee consent thereto: *Provided, further*, that such person or persons, so mining as aforesaid, shall pay to the owner or lessee of said lands giving such permit or consent the royalty for mining thereon, at least once every month, if demanded by such owner or lessee, by delivering the same to him at or near the mouth or opening of such mine, shaft or quarry, or at the nearest usual place of business of such owner or lessee, or at any other place that may be agreed upon by such miner and owner or lessee; which said royalty, unless otherwise agreed upon by them, shall be the same in kind and proportionate amount as is paid by others mining the same kind of ore or mineral on said lands to such owner or lessee, or the value of such royalty in cash; and if there be no other person mining on said lands on terms prescribed by such owner or lessee, than he or they shall pay to such owner or lessee the same rate and kind of royalty on lead ore or minerals taken out by him or them as is paid by miners on lands nearest thereto belonging to other persons, or the value of such royalty in cash. Such owner or lessee of any real estate shall have a lien on all minerals taken or dug therefrom for the royalty due thereon until the same is paid; and if any such person or persons so mining shall refuse or fail to pay such royalty to such owner or lessee, or his agent, when demanded as aforesaid, he or they shall thereby forfeit the right to work such mine, shaft, quarry, prospect or deposit of mineral, and the said owner or lessee may thereupon enter and take possession of the same. (R. S. 1879 § 6442.)

SEC. 7036. *Tender of payment*.—Any such person or persons who, by the permission or consent of the owner or lessee of any real estate, and having the right

(*a*) The statement in this section amounts to a license, revocable upon condition broken, and when forfeited proprietor may re-enter and take possession. 74 Mo. 173.

to mine thereon, and having entered and dug or mined thereon any lead ore or other mineral, shall have the right to the exclusive possession of such ore or mineral, except the royalty thereon, which shall be paid as hereinbefore provided, until he or they shall be paid or tendered by such owner or lessee of such real estate the then highest market price in cash paid by such owner or lessee for the same kind of ore or mineral dug or mined on said lands, and if no other such ores or minerals are at the time being dug or mined on said lands and sold to such owner or lessee, then the highest price paid for such ore or mineral dug on lands nearest thereto shall be paid or tendered by such owner or lessee; in such case, and upon such payment or tender, the absolute right to the possession of such lead ore or other minerals so dug out and mined under the provisions of the next preceding section, and for which such payment or tender shall have been made, shall vest in such owner or lessee. (R. S. 1879, § 6443.)

SEC. 7037. *Notice to owner or lessee.*—If any person or persons having dug or mined lead or other mineral, and having the same in his or their possession, and having offered to deliver such mineral according to contract, or paid or tendered the royalty, if any, due thereon, or the value of such royalty in cash, to such owner or lessee of said real estate, or to his agent, shall serve or cause to be served a notice in writing upon such owner or lessee or his agent, by delivering to him a copy thereof, or by leaving a copy thereof at the usual place of abode of such owner, lessee or agent, with some member of the family over the age of fifteen years, stating in such notice the amount of lead ore or other mineral he or they have ready for delivery, and requiring such owner, lessee or agent to receive and pay for the same, the said owner or lessee shall, within five days after the service of such notice, receive and pay for such lead ore or other mineral which the said person or persons digging or mining the same may deliver to him, not exceeding the amount named in the notice; and in such case, if such owner or lessee fail or refuse within the time aforesaid to pay for such lead ore or mineral delivered or offered to be delivered to him as aforesaid at the said price, then in that event the said person or persons who dug and mined the same shall thereupon acquire an absolute title to such lead ore or mineral, and may thereupon dispose of the same to any person or in any manner he or they may choose. (R. S. 1879, § 6444.)

SEC. 7038. *Sale of ore.*—All lead ore or other mineral, dug or mined in or upon the lands of any person in this state, shall be deemed and held to be the absolute property of the owner or lessee of such lands, except in cases it is modified, changed or transferred by express contract; and any person who shall unlawfully sell or convert to his own use or remove or dispose of or in any manner make away with or conceal any such ore or mineral, so as to deprive the owner thereof of the same, shall be deemed guilty of grand or petit larceny, according to the value of such ore or mineral. (R. S. 1879, § 6445.)

SEC. 7039. *Injunction or restraining orders—notice of application to dissolve.*—No injunction or restraining order shall be granted by any court or by any judge thereof to enjoin or restrain the working of any mine or mines, or in any manner to interfere with the same, except upon notice first being given to the person working or operating said mine or mines, and sought to be enjoined or restrained, which notice shall be served by delivering to such person a copy thereof, or by leaving a copy thereof at his usual place of abode with a member of the family over the age of fifteen years, at least five days before the day set for the hearing of the application for the injunction; and the court or judge granting such injunction or restraining order shall have the power, upon good cause being shown, to dissolve, vacate or modify any such injunction or restraining order at any time after the same shall

have been granted, whether in [term] time or vacation: *Provided*, that the party applying to such court or judge to dissolve, vacate or modify any such injunction or restraining order shall give due notice to the opposite party of such intended application. (R. S. 1879, § 6446.)

SEC. 7040. *Affidavit of course of drift and order to be made.*—When any owner, tenant or sub-tenant of a lot or lots or tract of land shall file with any justice of the peace within the county in which said lot or lots or tract of land may be situated his or her affidavit, or the affidavit of any other creditable person for them, stating that from knowledge, information or belief, the party or parties owning, controlling or working the adjoining lot or lots or tract of land, and upon which said party or parties are sinking shafts, mining, excavating and running drifts, and that said drifts in which said parties are digging, mining and excavating mineral ore or veins of coal extend beyond the lines and boundaries of said lot or lots or tract of land, owned, controlled or worked by them, and have entered in and upon the premises of the party or parties making said affidavit, or for whom said affidavit is made, the justice of the peace, after first being tendered his lawful fees, shall issue his written order and deliver or cause the same to be delivered to the county surveyor or his deputy, commanding him, after his reasonable fees have been tendered, to proceed without delay to survey said drift by entering any and all shafts upon said lot or lots or tract of land that he (the surveyor) may see fit, for the purpose of ascertaining the course and distance of said drift or drifts, and to locate the same upon the surface. (R. S. 1879, § 6447.)

SEC. 7041. *Order to be read.*—The surveyor shall, before entering upon said duty, read said order to the party or parties owning, controlling or working any shaft or shafts on said lot or lots or tract of land. (R. S. 1879, § 6448.)

SEC. 7042. *Refusal to obey order a misdemeanor.*—If said party or parties owning, controlling or working said shaft or shafts on said lot or lots or tract of land shall refuse, hinder or prevent said county surveyor or his deputy and his assistant from entering said shaft or shafts or drifts, to make the survey so ordered by the justice of the peace, and every person so offending shall, on conviction, be adjudged guilty of a misdemeanor, and punished by imprisonment in the county jail for a term of not exceeding one year or by fine not exceeding three hundred dollars, or by both said fine and imprisonment. (R. S. 1879 § 6449)

SEC. 7043. *Owner or lessee shall drain mine, etc.*—When any person owning any real estate in this state, or any person or persons having a leasehold therein for the purpose of mining for lead or zinc ore thereon by lease from such owner, shall open such real estate for mining purposes, and shall permit any person or persons other than their agents, servants or employes to enter and dig or mine for lead or zinc ores thereon, and shall make any rule or contract whereby any pump-rent or royalty is reserved unto said land owner or lessee for the drainage of the land so mined, and shall fail or refuse to drain any such land or mining lot to the full depth to which the laborers are working or seeking to work, but prevented by water, then and in such event, such owner or lessee thereof shall not be entitled to collect or retain any pump-rent or royalty so reserved as aforesaid for any ores taken from said mine or lot, below the depth of the water-level in said mine or lot, so long as said owner or lessee shall fail or refuse to drain said mine, nor shall such land owner or lessee be entitled to forfeit any right to hold and mine said lot so long as work is prevented therein by reason of water accumulated therein, on account of any failure to drain said mine by such land owner or lessee, any rule, contract or agreement to the contrary notwithstanding. (New section.)

SEC. 7044. *Scrapping for ore prohibited, etc.—penalty.*—It shall be unlawful for any person to take or in any manner receive or obtain any lead or zinc ore by means of gleaning or culling, commonly called "scrapping," without first having obtained the written consent of the person having possession and control of the mine from which said ores are to be taken; and it shall be unlawful for any person or company of persons to purchase, or in any manner to receive any lead or zinc ore which may have been stolen or taken by means of culling or gleaning, commonly called "scrapping," without such written consent as aforesaid, knowing that said ores have been so stolen or taken without written consent, as herein provided. Any person violating the provisions of this section, on conviction shall be punished by a fine of not more than one hundred dollars, or by imprisonment in the county jail not more than one year, or by both such fine and imprisonment; and the inadequacy of the price paid for such ore, the quantity purchased or received, and the fact that the person from whom such ores may have been purchased or received is not regularly engaged in running or operating mines for such ores, may be shown, and shall be received as *prima facie* evidence of guilty knowledge of the person so purchasing or receiving such ores: *Provided, however,* that nothing herein contained shall be so construed as to prevent any person from gleaning, culling or scrapping for ores about his own mine, nor to prevent any person from purchasing such ores when the same have been obtained in such manner by the owner or operator of any such mine. (New section.)

SEC. 7045. *Indemnity bond required to mine in certain cities, etc.—violation a misdemeanor—penalty.*—No person, company or corporation shall hereafter sink a shaft, mine, tunnel, excavate or drift for coal, or take out any coal of any kind within the corporate limits or designated boundaries of any city, town or village in this state containing one thousand inhabitants or more, without having first applied and filed, and have approved, an indemnity bond as hereinafter provided for; and any person or persons violating the provisions of this section, and any member or stockholder or officer of any company or corporation who shall violate the provisions of this section, shall be deemed guilty of a misdemeanor, and on conviction thereof, shall be punished by a fine of not less than five hundred dollars, or imprisonment in the county jail for not less than six months, or by both such fine and imprisonment. (R. S. 1879, § 6450.)

SEC. 7046. *Notice of intention to mine—publication required.*—Every person, company or corporation desiring to carry on any of the mining operations provided for in the preceding section shall give at least thirty days' notice of such intention by notice printed and published in some newspaper printed in such town, city or village where such mining operations are proposed to be carried on, or if no newspaper be printed in such city, town or village, then in some newspaper printed in said county, or if no newspaper be printed in such county, then by written or printed hand-bills posted up in six public places in the city, town or village wherein such mining operations are proposed to be carried on. Such notice shall contain an accurate description of the locality where such mining operations are to be carried on, giving the number of lot and block, and shall also state the nature of such mining operations, and name some day of the term of the next circuit court in said county, thereafter to be holden, when such person, company or corporation will offer for filing and approval the indemnity bond hereinafter provided for. (R. S. 1879, § 6451.)

SEC. 7047. *Petition to circuit court—court to fix and approve bond.*—On the day mentioned in such notice, the persons, company or corporation proposing to carry on such mining operations shall present their petition to said circuit court, setting

out the locality of the proposed mines and the nature and extent of the proposed mining operations, and shall also file with such petition the title papers of such person or company or corporation to the lands on which such mining operations are proposed to be carried on, showing either the fee simple title of such land in such company, or the right to mine beneath or in such land, and shall also contain the names of all persons to be offered as security upon the mining bond of such persons, company or corporation, and shall pray the court to fix and approve the mining bond of such persons or corporation. (R. S. 1879, § 6452.)

SEC. 7048. *Testimony on application—bond, etc.—time granted.*—The court may, upon such application, hear testimony upon all the matters involved in such application, including testimony upon the solvency and responsibility of the sureties offered, and may hear testimony from any parties interested in the lots and lands in the neighborhood of such proposed mining operations, and if the court is satisfied that the proposers own the land or mining privileges under the land described in their petition, the court shall fix the amount of the bond to be given by such proposers, such bond to be in no case for less than one thousand dollars; and upon the giving and approval of such bond so fixed by the court, the court shall enter its order authorizing the mining operations specified in said petition, and upon the localities therein named, and not elsewhere, for the space of two years, unless in the meanwhile revoked. (R. S. 1879, § 6453.)

SEC. 7049. *Bond required.*—Such bond shall be signed by the proposers, and by not less than two sureties, to be approved by said court, residents of the county wherein such mining is to be carried on, and shall be made payable to the state of Missouri, and conditioned that the principal in said bond shall carry on the mining operations proposed in the petition in a careful manner, and the said parties shall not mine, dig, excavate nor take coal nor earth from nor under any land or lots than that described in the said bond, and shall pay all damages that may be sustained by any and all persons by reason of the violation of any of the conditions of said bond, and any and all charges, fines and penalties that may be levied, assessed against or imposed upon the said proposers, their agent, servants, stockholders, officers or employes, by reason of any violation of the conditions of said bond or any of the provisions of this law. (R. S. 1879, § 6454.)

SEC. 7050. *Written permission of property owner—violation, misdemeanor—penalty, fines, etc.*—Any person or persons who shall in person or by their servant, agent or employe, dig, excavate, mine, tunnel or drift upon or under the lands or lots of another, within the incorporate limits or designated boundaries of any city, town or village in this state, and every officer and stockholder that shall either authorize or permit its servants, agents or employes to dig, excavate, mine, tunnel or drift upon or under the lands or lots of another within such limits or boundaries of such city, town or village, without the written permission of the owner or owners of such land or lots, shall be deemed guilty of a misdemeanor, and shall be punished, on conviction, for every such offense, by fine of not less than five hundred dollars, with costs, which fine and costs, if not paid within five days after conviction, may be sued for and recovered against the parties and sureties on the mining bond of such persons, company or corporation liable for such acts, in a suit upon such bond, in the name of the state of Missouri, to the use of the county in which such offense is committed; such fine, when collected, shall be paid, one-half to the owner of the property injured by such offense, and the other half into the school fund of such county; but no such conviction shall be a bar to the owner of such property prosecuting a suit on said bond to his own use for the damages sustained by any such offense. Every such conviction, whether appealed from or not, shall work a for-

feiture of the authority to mine granted such person, company or corporation liable, and they shall not proceed further with the operations, except by making application and giving a new bond as in the first instance. (R. S. 1879, § 6455.)

SEC. 7051. *Costs attending notice.*—The costs attending the giving notice, making application and receiving mining privileges shall all be paid by the person, company or corporation making the same, and no such privilege shall take effect until all such costs be paid. (R. S. 1879, § 6456.)

SEC. 7052. *Diagram of mines, etc., to be filed in court.*—At each term of the circuit court, during the continuance of any mining license, every person, company or corporation carrying on such mining operations shall, at their own expense, cause to be made by the county surveyor of the county where such mines are located, and filed with the court, under oath of such surveyor, a complete and true diagram of such mines, showing with reference to the boundaries of such mines, and the lots and lands of neighboring owners, the extent of such mines, their drifts, tunnels and excavations, giving the length and breadth of each drift, bank and tunnel, so as to fully inform the court and parties in interest of the extent and character of such mining operations. Such plats and diagrams shall remain on file with the clerk of such court, and shall not be removed by any one from the file of such court. Any failure to file the diagram and plat herein provided for, or to make such diagram show all the particulars herein provided for, shall work a forfeiture of the mining privileges of such person, company or corporation, which forfeiture the court shall, on the motion of any party in interest, declare on three days' notice to the party holding such license or privilege. (R. S. 1879, § 6457.)

SEC. 7053. *Application of article to mining companies.*—In no case shall the eight preceding sections of this article be so construed as to apply to persons, companies or corporations engaged in mining for lead, zinc or other ores or minerals, except coal. (R. S. 1879, § 6458, amended.)

SEC. 7054. *Screening coal before weighing prohibited.*—It shall be unlawful for any mine owner, lessee or operator of coal mines in this state, employing miners at bushel or ton rates, or other quantity, to pass the output of coal mined by said miners over any screen or other device which shall take any part from the value thereof, before the same shall have been weighed and duly credited to the employee sending the same to the surface, and accounted for at the legal rate of weights as fixed by the laws of Missouri. (Laws 1885, p. 207.)

SEC. 7055. *Weighman shall take an oath, etc., penalty.*—The weighman employed at any mine shall subscribe an oath or affirmation before a justice of the peace, or other officer authorized to administer oaths, to do justice between employer and employee, and weigh the output of coal from the mines as herein provided. The miners employed by or engaged in working for any mine owner, operator or lessee of any mine in this state shall have the privilege, if they desire, of employing at their own expense a check-weighman, who shall have like rights, powers and privileges in the weighing of coal as the regular weighman, and be subject to the same oath and penalties as the regular weighman. Said oath or affirmation shall be kept conspicuously posted in the weigh office, and any weigher of coal, or person so employed, who shall knowingly violate any of the provisions of this article, shall be deemed guilty of a misdemeanor, and, upon conviction, shall be punished by fine of not less than twenty-five nor more than one hundred dollars for each offense, or by imprisonment in the county jail for a period not to exceed thirty days, or by both such fine and imprisonment, proceedings to be instituted in any court having competent jurisdiction. (Laws 1885, p. 208, amended, Laws 1887, p. 218, amended.)

SEC. 7056. *Penalty for using false scales.*—Any person or persons having or using any scale or scales for the purpose of weighing the output of coal at mines, so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatsoever, by reason of which such coal is not correctly weighed and reported in accordance with the provisions of this article, shall be deemed guilty of a misdemeanor, and shall, upon conviction, for each such offense, be punished by a fine of not less than two hundred dollars nor more than five hundred dollars, or by imprisonment in the county jail for a period not to exceed sixty days, or by both such fine and imprisonment, proceedings to be instituted in any court of competent jurisdiction. (Laws 1885, p. 208.)

SEC. 7057. *Shall apply to loaders in certain mines.*—The manner of weighing, as hereinbefore provided for, shall apply to the class of workers in mines known as loaders, engaged in mines wherein the mining is done by machinery, whenever the workmen are under contract to load coal by the bushel, ton, or any quantity the settlement of which is had by weight. (Laws of 1885, p. 208, amended.)

SEC. 7058. *Checks redeemable in money or goods, etc.*—It shall not be lawful for any corporation, person or firm engaged in manufacturing or mining in this state to issue, pay out or circulate for payment of the wages of labor, any order, check, memorandum, token or evidence of indebtedness, payable in whole or in part otherwise than in lawful money of the United States, unless the same is negotiable and redeemable at its face value, without discount, in cash or in goods, wares or merchandise or supplies, at the option of the holder, at the store or other place of business of such firm, person or corporation, or at the store of any other person on whom such paper may be drawn, where goods, wares or merchandise are kept for sale, sold or exchanged; and the person who, or corporation, firm or company which, may issue any such order, check, memorandum, token or other evidence of indebtedness, shall, upon presentation and demand, within thirty days from date or delivery thereof, redeem the same in goods, wares, merchandise or supplies at the current cash market price for like goods, wares, merchandise or supplies, or in lawful money of the United States, as may be demanded by the holder of any such order, memorandum, token or other evidence of indebtedness: *Provided*, that if said corporation, person or firm engaged as specified in this section have a regular pay-day once in every thirty days, then said corporation, person or firm shall not be required to redeem such token or evidence of indebtedness in cash until the first pay-day after the same become payable, as herein provided, and such token or evidence of indebtedness shall be presented for payment in cash only on such pay-days. (Laws 1881, p. 73, amended, Laws 1885, p. 93.)

SEC. 7059. *Employes to be paid monthly, etc.*—The employes of operators of mines mentioned in this article shall be regularly paid at least once in every thirty days, and at no pay-day shall there be withheld of the earnings of any employe any sum to exceed the amount due him for his labor for the four days next preceding any such pay-day. And such operators shall, whenever demand therefor shall be made by any employe, issue to such employe a due-bill for the amount due him up to the day of the demand, which due-bill shall be negotiable, whatever the form thereof shall be, and shall be redeemed by such operator in cash or its equivalent, at the option of the holder, on any pay-day, if the same shall be presented for redemption by any holder thereof; and any such operator failing or refusing to pay his employes, or to issue to them his due-bills as in this section provided, shall become immediately liable to any such employe in double the sum due such employe at the time of such failure or refusal, to be recovered by civil action in the name of such employe in any court of competent jurisdiction of the state. And no employe

within the meaning of this article shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof. (New section.)

SEC. 7060. *Refusal to redeem orders—penalty*—Any officer or agent of any corporation, or any person, firm or company engaged in the business of manufacturing or mining in this state, who by themselves or agent shall issue or circulate in payment for wages of labor any order, check, memorandum, token or evidence of indebtedness, payable in whole or in part otherwise than in lawful money of the United States, without being negotiable and payable at the option of the holder in goods, wares, merchandise, supplies or lawful money of the United States, as required by section 7058 of this article, or who shall fail to redeem the same when presented for payment within thirty days from date of delivery thereof, by said company or its agents at his or their office or place of business, in lawful money of the United States, or who shall compel or attempt to coerce any employe of any such corporation, person, firm or company to purchase goods, wares, merchandise or supplies from any particular person, firm or corporation, shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten nor more than five hundred dollars for each and every such offense. (Laws 1885, p. 84.)

ARTICLE II.

SAFETY AND INSPECTION OF MINES.

SECTION

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- 7062. Inspector to make maps if owner fails, etc.
- 7063. Escapement shaft, when and how constructed, etc.
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SECTION

- 7069. Accidents—duty and power of inspector, etc.
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- 7077. Explosives to be kept in strong box, etc.

SEC. 7061. *Maps of mine to be prepared, etc.*—The owner, agent or operator of each and every mine in this state, employing ten or more men, shall make or cause to be made, at the discretion of the inspector or other person acting in that capacity, an accurate map or plan of the workings of such mine and each and every vein thereof, showing the general inclination of the strata, together with any material deflections in the said workings and the boundary lines of said mine, and deposit a true copy of said map or plan with the clerk of the county court of each county wherein may be located the said mine; which said map or plan shall be so filed or deposited within three months after the time when this article shall take effect, and a copy of such map or plan shall also be kept for inspection at the office of the said mine; and during the month of January of each and every year after this article shall have taken effect, the said owner, agent or operator shall furnish the inspector and the clerk of the county court as aforesaid with a statement, and a further map or plan of the progress of the workings of such mine, continued from the last report to the end of the month of December next preceding, and the inspector shall correct his map or plan of said workings in accordance with the statement and map or

plan thus furnished; and when any mine is worked out or abandoned, that fact shall be reported to the inspector, and the map or plan of such mine in the office of the clerk of the county court shall be carefully corrected and verified. (Laws 1887, p. 219.)

SEC. 7062. *Inspector to make map if owner fails—cost.*—Whenever the owner, agent or operator of any mine shall neglect, fail or refuse to furnish the said inspector and clerk as aforesaid with a statement, the map or plan or addition thereto, as provided in the first section of this article, at the times and in the manner therein provided, the said inspector is hereby authorized to cause an accurate map or plan of the workings of such mine to be made at the expense of the said owner, agent or operator, and the cost thereof may be recovered by law from said owner, agent or operator, in the same manner as other debts, by suit in the name of the inspector and for his use. (Laws 1887, p. 219.)

SEC. 7063. *Escapement shafts, when and how constructed, etc.*—In all coal mines that are now or have been in operation prior to the first day of January, 1887, and which are worked by or through a shaft, slope or drift, and in which more than ten miners are employed in each twenty-four hours, if there is not already an escapement shaft to each and every said mine, or communication between each and every mine and some other contiguous mine, then there shall be an escapement shaft or other communication, such as shall be approved by the mine inspector, making at least two distinct means of ingress and egress for all persons employed or permitted to work in such mine. Such escapement shaft or other communication with a contiguous mine aforesaid shall be constructed in connection with every vein or stratum of coal worked in such mine, and the time to be allowed for such construction shall be one year when such mine is under one hundred feet in depth, two years when such mine is over one hundred feet and under three hundred feet, and three years when it is over three hundred feet and under four hundred feet, and four years when it is over four hundred feet in depth, and five years for all mines over five hundred feet, from the time this article goes into effect; and in all cases where the working face of one mine has been driven up to or into the workings of another mine, the respective owners of such mine, while operating the same, shall keep open a roadway at least two and one-half feet high and four feet wide, thereby forming a communication as contemplated in this article, and for a failure to do so shall be subject to the penalty provided for in section 7069 of this article, for each and every day such roadway is unnecessarily closed. Each and every such escapement shaft shall be separated from the main shaft by such extent of natural strata as shall secure safety to the men employed in such mines—such distance to be left to the discretion and judgment of the mine inspector or person acting in that capacity; and in all coal mines that shall go into operation for the first time after the first day of January, 1888, such an escapement or other communication with a contiguous mine, as aforesaid, shall be constructed within one year after such mine shall have been put into operation. And it shall not be lawful for the owner, agent or operator of any such mine as aforesaid to employ any person to work therein, or permit any person to go therein for the purpose of working, except such persons as may be necessary to construct such an escapement shaft, unless the requirements of this section shall have first been complied with; and the term "owner" used in this article shall mean the immediate proprietor, lessee or occupant of any mine, or any part thereof, and the term "agent" shall mean any person having, on behalf of the owner, the care or management of any mine, or any part thereof: *Provided*, nothing in this section shall be construed to extend the time allowed by law for constructing escapement shaft. (Laws 1887, p. 219, amended.)

SEC. 7064. *Ventilation—fire-damp.*—The owner, agent or operator of every mine, whether operated by shaft, slope or drift, shall provide and maintain for every such mine a sufficient amount of ventilation, to be determined by the inspector, at the rate of one hundred cubic feet of air per man per minute, measured at the foot of the downcast, which shall be forced and circulated to the face of every working place throughout the mine, so that said mine shall be free from standing gas of whatsoever kind; and in all mines where fire-damp is generated, every working place where such fire-damp is known to exist shall be examined every morning with a safety-lamp by a competent person, before any other persons are allowed to enter. The ventilation required by this section may be produced by any suitable appliances, but in case a furnace shall be used for ventilating purposes, it shall be built in such a manner as to prevent the communication of fire to any part of the works, by lining the upcast with incombustible material for a sufficient distance up from said furnace. (Laws 1887, p. 220.)

SEC. 7065. *Bore-holes.*—The owner, agent or operator shall provide that bore-holes shall be kept twenty feet in advance of the face of each and every working place, and, if necessary, on both sides, when driving toward an abandoned mine and part of a mine suspected to contain inflammable gases or to be inundated with water. (Laws 1887, p. 220.)

SEC. 7066. *Signaling—hoisting—certain minors not to work, etc.*—The owner, agent or operator of every mine operated by shaft shall provide suitable means of signaling between the bottom and the top thereof, and shall also provide safe means of hoisting and lowering persons in a cage covered with boiler iron, so as to keep safe, as far as possible, persons descending into and ascending out of said shaft; and such cage shall be furnished with guides to conduct it on slides through such shaft, with a sufficient brake on every drum to prevent accident in case of the giving out or breaking of machinery; and such cage shall be furnished with spring catches, intended and provided, as far as possible, to prevent the consequences of cable breaking or the loosening or disconnecting of the machinery; and no props or rails shall be lowered in a cage while men are descending into or ascending out of said mine: *Provided*, that the provision of this section in relation to covering cages with boiler iron shall not apply to coal mines less than one hundred feet in depth, where the coal is raised by horse-power. No male person under the age of twelve years, or female of any age, shall be permitted to enter any mine to work therein; nor shall any boy under the age of fourteen years, unless he can read or write, be allowed to work in any mine. Any party or person neglecting or refusing to perform the duties required to be performed by the provisions of this article shall be deemed guilty of a misdemeanor, and punished by a fine in the discretion of the court trying the same, subject, however, to the limitations as provided by section 7069 of this article. (Laws 1887, p. 221, amended.)

SEC. 7067. *Regulations for hoisting.*—No owner, agent or operator of any mine operated by shaft or slope shall place in charge of any engine whereby men are lowered into or hoisted out of the mines, any but an experienced, competent and sober person, not under eighteen years of age; and no person shall be permitted to ride upon a loaded cage or wagon used for hoisting purposes in any shaft or slope, and in no case shall more than twelve persons ride on any cage or car at one time, nor shall any coal be hoisted out of any mine while persons are descending into such mine; and the number of persons to ascend out of or descend into any mine on one cage shall be determined by the inspector; the maximum number so fixed shall not be less than four nor more than twelve; nor shall be lowered or hoisted more rapidly than five hundred feet to the minute. (Laws 1887, p. 221, amended.)

SEC. 7068. *Boilers—fencing entrances—signals, etc.*—All boilers used in generating steam in and about coal mines shall be kept in good order, and the owner, agent or operator, as aforesaid, shall have said boiler examined and inspected by hydrostatic pressure and warm water, by a competent boiler-maker or other qualified person, as often as once every six months, and the result of every such examination shall be certified in writing to the mine inspector; and the top of each and every shaft, and the entrance of each and every immediate working vein shall be securely fenced by gates properly covering and protecting such shaft and entrance thereto; and the entrance to every abandoned slope, air or other shaft, shall be securely fenced off; and every steam boiler shall be provided with a proper steam gauge, water gauge and safety valve, and all under-ground self-acting or engine planes or gangways on which coal cars are drawn and persons travel, shall be provided with some proper means of signaling between the stepping places and the end of said planes or gangways, and sufficient places of refuge at the sides of such planes or gangways shall be provided at intervals of not more than twenty feet apart. (Laws 1887, p. 221, amended.)

SEC. 7069. *Accidents—duty and power of inspector, etc.*—Whenever loss of life or serious personal injury shall occur by reason of any explosion or of any accident whatsoever, in or about any mine, it shall be the duty of the person having charge of such mine to report the facts thereof without delay to the state mine inspector, and if any person is killed thereby, to notify the coroner of the county also, or in his absence and inability to act, any justice of the peace of said county; and the said inspector shall, if he deem it necessary from the facts reported, immediately go to the scene of said accident and make suggestions and render such assistance as he may deem necessary for the safety of the men; and the inspector shall investigate and ascertain the cause of such explosion or accident and make a report thereof, which he shall preserve with the other records of his office; and to enable him to make such investigation, he shall have the power to take depositions, compel the attendance of witnesses and administer oaths or affirmations to them; and the cost of such investigation shall be paid by the county court of the county in which such accident shall have occurred, in the same manner as costs of coroners' inquests are now paid. And a failure on the part of a person having charge of any mine in which any such accident may have occurred to give notice to the inspector or coroner, as provided for in this section, shall subject such a person to a fine of not less than one hundred nor more than three hundred dollars, to be recovered of him in the name of the state of Missouri, before any justice of the peace of such county wherein the mine is situate and the accident occurred; and such fine, when collected, shall be paid into the county treasury for the use and benefit of said county. (Laws 1887, p. 222.)

SEC. 7070. *Fines, how recovered.*—In all cases in which punishment is not provided for by fine under this article, for a breach of any of its provisions, the fine for the first offense shall not be less than fifty nor more than two hundred dollars, and for the second offense not less than two hundred nor more than five hundred dollars, to be recovered in any court of the state having competent jurisdiction. (Laws 1887, p. 222.)

SEC. 7071. *Governor to appoint inspector, etc.*—The governor shall appoint an inspector of mines, who shall serve for two years, and shall have a practical mining experience, but not be interested in any mine, and shall receive a salary of \$1500 per annum and his actual traveling expenses. He shall have his office in the office of the commissioner of labor statistics, and when not inspecting mines, act as a clerk in said office, giving his whole time to the state. (Laws 1887, p. 222, amended.)

SEC. 7072. *Duties of inspector—reports.*—The inspector provided for in this article shall see that every necessary precaution is taken to secure the health and safety of the workmen employed in any of the mines in this state, that the provisions and requirements provided for in this article be faithfully observed and obeyed, and the penalties of the law enforced. He shall also collect and tabulate in his report, to be made to the bureau of labor statistics on the 15th day of October of each year, the extent of workable mining lands in this state, by counties; also the manner of mining, whether by shaft, slope or drift, the number of mines in operation, the number of men employed therein, the amount of capital invested, and the amount of mineral, coal, etc., produced. (Laws 1887, p. 222.)

SEC. 7073. *Inspector may enter mines at any time, etc.*—It shall be lawful for the inspector provided for in this article to enter, examine and inspect any and all mines and machinery belonging thereto, at all reasonable times, by day or by night, but so as not to obstruct or hinder the necessary workings of such mine, and the owner, agent or operator of every such mine is hereby required to furnish all necessary facilities for such entering, examination and inspection; and if the said owner, agent or operator aforesaid shall refuse to permit such inspection, or to furnish the necessary facilities for such entry, examination and inspection, the inspector shall file his affidavit setting forth such refusal before the judge of the circuit court in said county in which said mine is situated, either during the term of the court or during vacation, and obtain an order on such owner, agent or operator so refusing as aforesaid, commanding him to permit and furnish such facilities for the inspection of such mine, or to be adjudged to stand in contempt of court and punished accordingly; and if the said inspector shall, after examination of any mine and the works and machinery pertaining thereto, find the same to be worked contrary to the provisions of this article, or unsafe for the workmen therein employed, said inspector shall, through the circuit attorney of his county, or any attorney in case of his refusal to act, acting in the name and on behalf of the state, proceed against the owner, agent or operator of such mine, either separately or collectively, by injunction, without bond, after giving at least two days' notice to such owner, agent or operator; and said owner, agent or operator shall have the right to appear before the judge to whom application is made, who shall hear the same on affidavits and such other testimony as may be offered in support as well as in opposition thereto; and if sufficient cause appear, the court, or judge in vacation, by order, shall prohibit the further working of any such mine in which persons may be unsafely employed contrary to the provisions of this article, until the same shall have been made safe and the requirements of this article shall have been complied with; and the court shall award such costs in the matter of said injunction as may be just; but any such proceedings so commenced shall be without prejudice to any other remedy permitted by law for enforcing the provisions of this article. (Laws 1887, p. 223.)

SEC. 7074. *In case of injury or death, right of action.*—For any injury to persons or property occasioned by any willful violation of this article, or willful failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby; and in case of loss of life by reason of such willful violation or willful failure as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any person or persons who were, before such loss of life, dependent for support on the person or persons so killed, for a like recovery of damages sustained by reason of such loss of life or lives. (Laws 1887, p. 223.)

SEC. 7075. *Rules of working mines—penalty.*—Any miner, workman or other person who shall knowingly injure any water-gauge, barometer, air-course or brattice, or shall obstruct or throw open any air-ways, or carry any lighted lamps or matches into places that are worked by the light of safety lamps, or shall handle or disturb any part of the machinery of the hoisting engine, or open a door to a mine and not have the same closed again, whereby danger is produced, either to the mine or those at work therein, or who shall enter into any part of the mine against caution, or who shall disobey any order given in pursuance of this article, or who shall do any willful act whereby the lives and health of persons working in the mine, or the security of the mine or miners or the machinery thereof is endangered, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by fine or imprisonment, at the discretion of the court. (Laws 1887, p. 224.)

SEC. 7076. *Prop timbers.*—The owner, agent or operator of any mine shall keep a sufficient supply of timber, when required to be used as props, so that the workmen may at all times be able to properly secure the said workings from caving in, and it shall be the duty of the owner, agent or operator to send down all such props when required. (Laws 1887, p. 224.)

SEC. 7077. *Explosives to be kept in strong box, etc.*—All miners or other persons employed in and about a mine, using gun and blasting powder or other explosive, shall have and keep a strong box in which all surplus gun or blasting powder or other explosives in the mine shall be kept, excepting so much only as is necessary for immediate use. These boxes shall be kept locked, and not opened unless it be to put in or take out powder; nor must these strong (or powder) boxes be nearer than one hundred feet to the place of blasting. And in all dry and dusty coal mines or mines discharging light carbonated hydrogen gas, shot-firers must be employed to fire all shots after the employes and other persons have retired from the mine: *Provided however*, that the above section shall refer only to mines working ten or more men. (New section.)

WAGES OF LABOR.

AN ACT to amend section 7059, of the Revised Statutes for the State of Missouri for 1889, concerning mines and mining.

Be it enacted by the General Assembly of the State of Missouri, as follows:

SECTION 1. That section 7059, of chapter 115, article I, of the Revised Statutes of Missouri of 1889, be amended by striking out the word "thirty," between the words "every" and "days," in the third line of said section, and inserting in lieu thereof the word "fifteen;" so that said section, when amended, shall read as follows:

SEC. 7059. *Employes to be paid semi-monthly, etc.*—The employes of operators of mines mentioned in this article shall be regularly paid at least once in every fifteen days, and at no pay-day shall there be withheld [any] of the earnings of any employe. And such operators shall, whenever demand therefor shall be made by any employe, issue to such employe a due-bill for the amount due him up to the day of the demand, which due-bill shall be negotiable, whatever the form thereof shall be, and shall be redeemed by such operator in cash or its equivalent, at the option of the holder, on demand, if the same shall be presented for redemption by any holder thereof; and any such operator failing or refusing to pay his employes, or

to issue to them his due-bills, as in this section provided, shall become immediately liable to any such employe in double the sum due such employe at the time of such failure or refusal, to be recovered by civil action, in the name of such employe, in any court of competent jurisdiction of the state. And no employe, within the meaning of this article, shall be deemed to have waived any right accruing to him under this section by any contract he may make contrary to the provisions hereof.

Approved April 20, 1891.

INSPECTION.

AN ACT to amend section 7074, chapter 115, article 2, of the Revised Statutes of the State of Missouri, relating to the safety and inspection of mines.

Be it enacted by the General Assembly of the State of Missouri, as follows :

SECTION 1. That section 7074, chapter 115, article 2, of the Revised Statutes of the state of Missouri, be and the same is hereby amended by striking out the word "willful" wherever the same occurs in said section—namely, after the word "any," in line two, after the word "or," in line three, and after the words "such" and "or" in line five—so that said section, when amended, shall read as follows :

Section 7074. For any injury to persons or property occasioned by any violation of this article or failure to comply with any of its provisions, a right of action shall accrue to the party injured for any direct damages sustained thereby ; and in case of loss of life by reason of such violation or failure as aforesaid, a right of action shall accrue to the widow of the person so killed, his lineal heirs or adopted children, or to any person or persons who were, before such loss of life, dependent for support on the person or persons so killed, for a like recovery of damages sustained by reason of such loss of life or lives : *Provided*, that all suits brought under this article shall be commenced within one year after any cause of action shall have accrued under this article, and not afterward ; *and provided further*, that any person entitled to sue under this section for loss of life or lives may recover any sum not exceeding ten thousand dollars.

Approved April 23, 1891.



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